The OIL WEEKLY

OIL and GAS ENGINEERING

FOR OIL AND GAS PRODUCTION AND PIPE LINE DIVISIONS

NEWS

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STATISTICS

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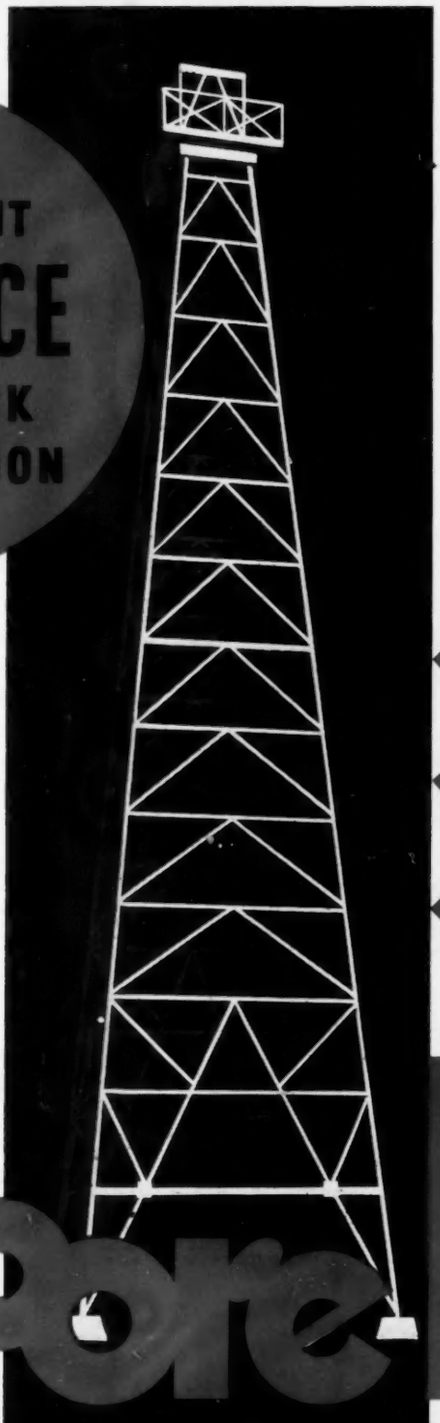

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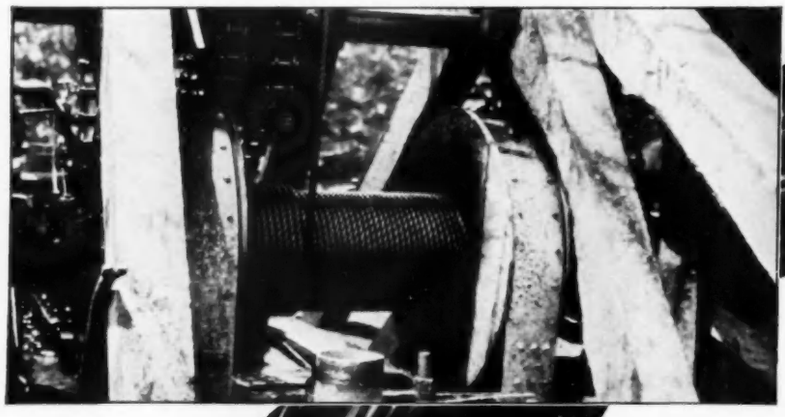

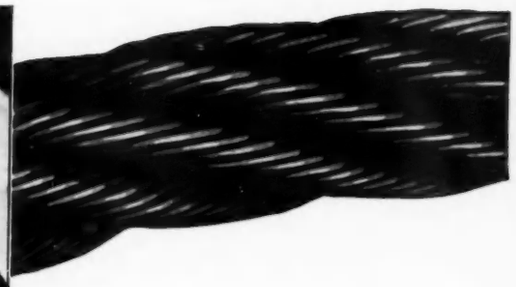

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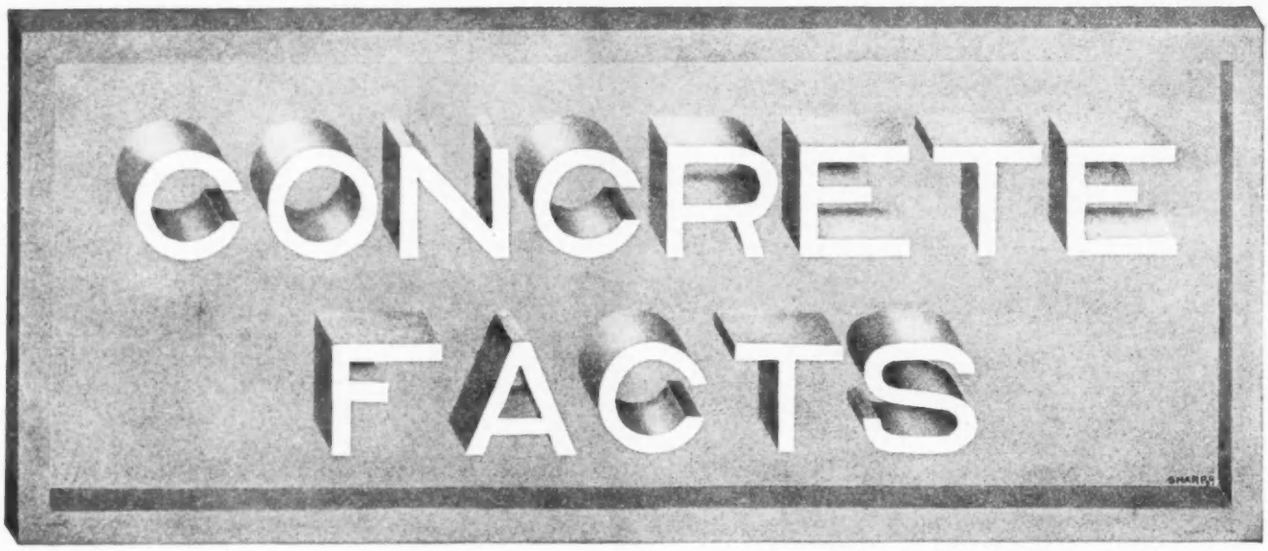

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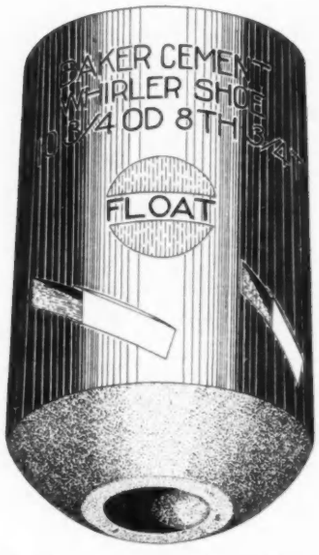

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THE OIL WEEKLY

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S. W. ROBINSON
Editor

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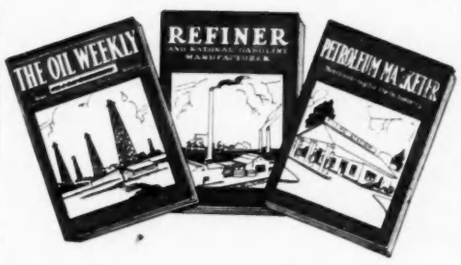

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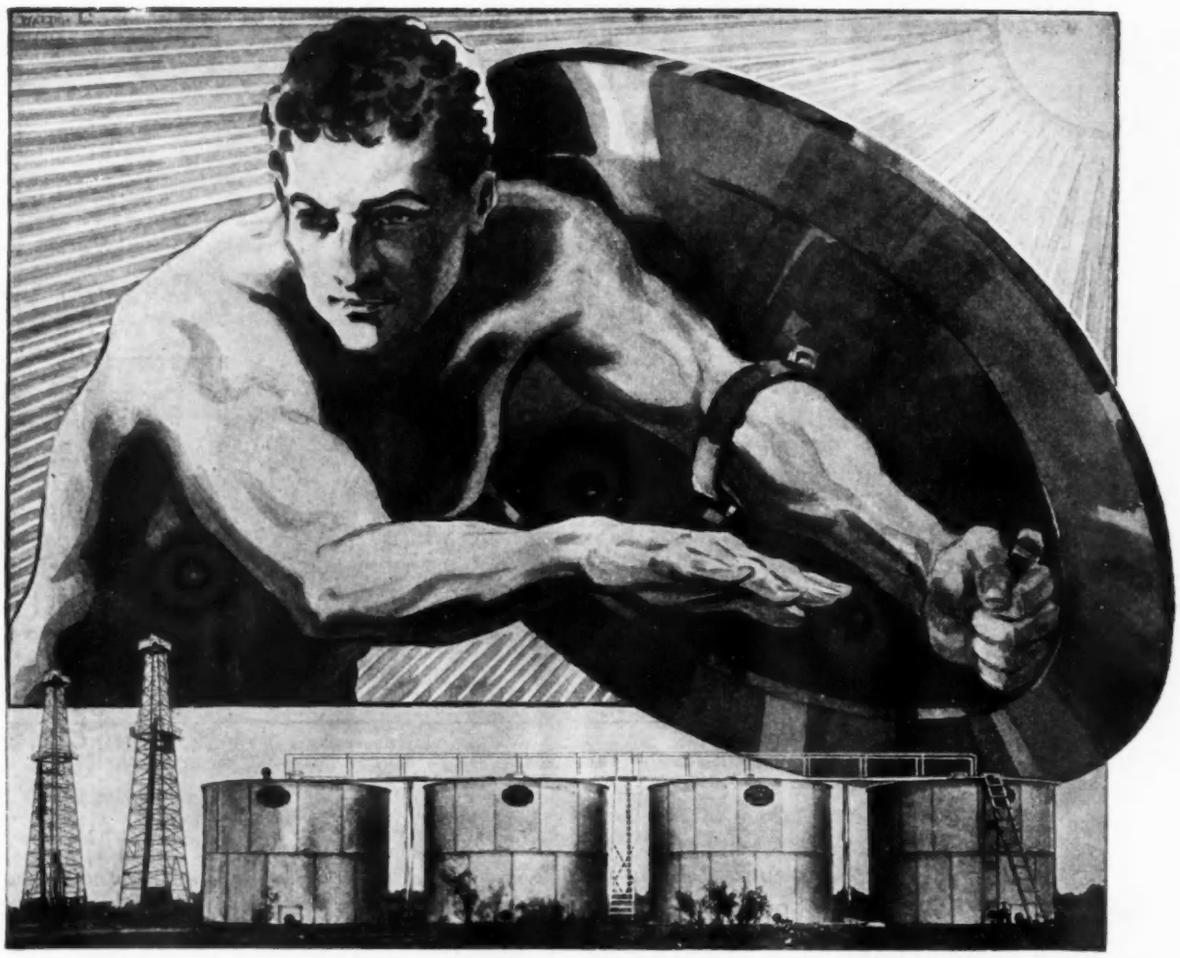

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THE OIL WEEKLY

FOR OIL AND GAS PRODUCTION AND
PIPE LINE DIVISIONS

ENGINEERING • NEWS • STATISTICS

What Price Pessimism?

R. L. DUDLEY

REACTIONS one gets at such a meeting as that of the A. P. I. just held at Tulsa sometimes are more interesting than any action the meeting itself may take.

The Tulsa meeting illustrates a state of mind that is typical of America today. After three days of observing the meeting there we feel a little more sympathetic with Congress on its "mad day" of last April.

The first day of the meeting saw a gathering of the clans that had not assembled in six to 12 months. There was a certain air of optimism apparent. The oil industry, one heard and felt, was going to lead the country out of the depression.

The situation, the oil situation, was not bad, one heard.

It really seemed like a glimpse of the old times—just a glimpse, but a refreshing one.

Then came the release of the Oil Conservation Board's report on the outlook of gasoline consumption, then the report of the Institute's own committee of qualified men on the same subject.

Both opined that consumption of gasoline would decline somewhat in excess of six per cent for the year.

Not so good—but not so bad. Six or seven per cent decline in the face of prices up over 10 per cent could be swallowed and the industry stay on its feet.

The word eased around that the directors thought otherwise. Not 6.6 per cent decline but a 15 per cent decline was what the directors thought. And then things took an indigo hue.

An A. P. I. refinery statistics and economics committeeman is just a fellow that the boss goes to for expert advice and information on such matters as figures, estimates, and trends. He is the fellow who has been making these consumption estimates for, in some instances, a good many years. And a director is usually one of the bosses.

The committeemen, both the A. P. I. and those of the Oil Conservation Board, had the most figures but the directors had the most say.

There were some unkind enough to say that the economics committee and the Oil Conservation Board committee had actually spent days working up the figures on which their reports were made and that such figures even though only an estimate should mean more than a pool of the opinion of the board of directors on this matter of decline.

We heard too, that before the economics committee report was finally delivered it was under fire and the economists stood their ground. We heard also, that they took the depression into consideration in their report and the Oil Conservation Board in its report actually said that the present trend was calculated into their report. There was only one-fifth of one per cent difference between the A. P. I. committee report and the Oil Conservation Board committee report, while the directors estimated a decline of more than twice that estimated by either of the committees.

After an official cloak was thrown around the directors opinion (by its inclusion in a telegram to congress) ah! what a change in the feeling and attitude.

It is a matter possibly worth noting that a considerable portion of the American public has worked around to the point that it rather gets a pleasure in bragging on the depression. We have noted a certain feeling of pride on the part of some when

they tell how much their incomes have been reduced. We have put a premium on the depression.

"NOT fifteen per cent but a twenty per cent decline," said one after the director's telegram had been made public. Twenty-three per cent" said another. And then we learned about what a helluva fix the oil business actually is in. We have heard much pessimistic talk since that famous October day in 1929 when a lot of us riders found out that the ass was not the animal under the saddle. But we'll put up against the cream of it what we heard our friends say on Thursday evening in Tulsa and by comparison the pre-Tulsa talk was optimistic. Anyway we can't well doubt, nor do we doubt the sincerity of the directors nor the men with whom we talked. They frankly are scared and they may be right although we do not believe it.

An observer who makes his livelihood in writing what he sees and hears is not necessarily the best judge of the fact or a condition. But years of observing cause him to take liberties with the great and near-great with a certain air of assurance that, in all humility, is not shaken by his personal knowledge that many of the great and near-great have been mistaken in their judgment as frequently as he has.

THIS is a free country, and as we heard some of the comments that thought arose in our minds: "If these men are right in what they give as the basis for their opinions then no one of us need worry about such a petty thing as the oil business. We had better be worrying about the American Government's stability and the safety of our families," which we believe is pure bosh.

We heard expressed no lack of confidence in its stability but we did fail to hear, in many instances, an expression of confidence that any constructive forces are at work. Apparently, most of the men we talked to failed to take that possibility into consideration.

For what our beliefs are worth we'll set them down.

We believe that despite the panic into which our national legislation has drifted, constructive plans will be worked out to aid the country to return to better times.

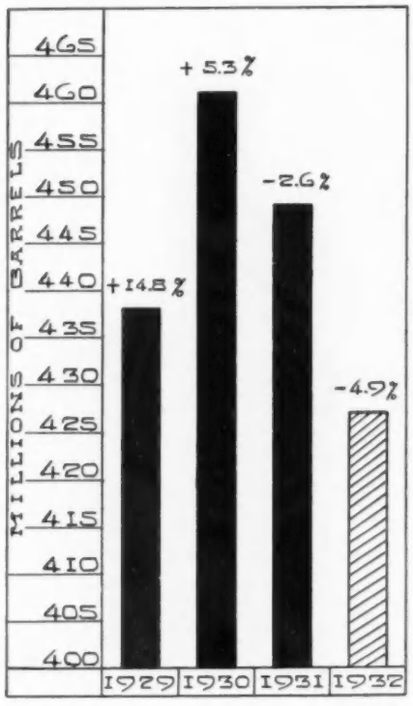
We believe that such constructive movements as may be developed will aid the oil industry along with other industries.

We believe that a return of confidence will release ample funds necessary to bring us out of the slough.

We believe that the report of the committee of economics will prove to be more nearly right than the opinion of the directors.

We believe, too, that now is a time for caution, that now is a time for conservative thinking, that now is no time to increase production and that refinery runs should be curtailed and the daily situation watched closely.

Trend of Gasoline Consumption



Total Sales (Domestic and Foreign) 1932—Actual First Quarter, Plus Average of Committee Estimates Last Nine Months.

WE believe that the fruits of long months of hard labor on the part of the oil industry to solve its problems will not be denied the workers.

We believe that the oil industry is undeniably in better shape than it was six months or a year ago and that its prospects right now are better than they were a year ago.

We believe that fear or excessive pessimism is as dangerous to straight thinking or action as is foolhardiness.

It is not our desire nor our intention to ridicule those who are honestly frightened, but let us not all fall into the fatal position that what we have on us now can only be gotten rid of by starving it out. That is not the American way out of our troubles, nor will it be the way we will win out of them.

Economic Report *Anticipates Drop in* Petroleum Demand

TULSA, JUNE 2.

A SURVEY of probable gasoline demand for the last nine months of 1932, conducted by the economic committees of both the American Petroleum Institute and the Federal Oil Conservation Board, shows that the petroleum industry faces a drop in domestic gasoline consumption of at least six per cent during this period. Export of gasoline is expected to show a decline under the same period of last year of from 12 to 14 per cent. With total gasoline demand for the first quarter of this year showing an actual decrease of 3.8 per cent, it is probable that the net loss for the year will amount to about five per cent. Moreover, individual opinions by leaders of the industry indicate a probable loss in this branch of the industry's business of as much as 15 per cent.

Following are some of the more important figures revealed by the forecasts of both committees, which were presented for discussion at the Mid-year meeting of The American Petroleum Institute:

Forecast for last nine months of 1932	American Petroleum Institute Committee	Federal Oil Conservation Board Committee
GASOLINE		
Total demand (barrels)	335,500,000	337,000,000
Decrease under last year	6.6%	6.2%
Domestic demand (barrels)	305,500,000	307,500,000
Decrease under last year	6.0%	5.4%
Exports (barrels)	30,000,000	29,500,000
Decrease under last year	12.5%	14.1%
Suggested Stocks:		
April 1 (actual)	66,950,000	66,950,000
June 30	59,655,000	59,450,000
September 30	45,280,000	44,950,000
December 31	47,435,000	48,500,000
CRUDE OIL		
Demand:		
Runs to stills (barrels)	615,881,000	622,000,000
Exports (barrels)	20,000,000	20,500,000
Used as such (barrels)	10,000,000	10,000,000
Supply:		
U. S. Production (barrels)	618,381,000	611,875,000
Imports (barrels)	32,000,000	33,650,000
Drawn from storage (barrels)	(Incl. in Prod.)	6,975,000
Daily production required (barrels)	2,248,700	2,225,000

SINCE the reports were prepared independently, it is significant to find them in practical agreement. The figures resulting from the findings of these committees represent weeks of concentrated study and consideration by competent statisticians and economists. Obviously, considerable difficulty was involved in the determination of a reliable forecast under existing economic conditions. Nevertheless, the figures are believed to present conditions as they will probably be found between now and the end of this year. Then too, they are based upon the experience of the first quarter of this year and actual conditions being recorded currently on the books of individual companies.

Explanation of basic considerations involving the compilation of estimates prepared by the Volunteer Committee on Petroleum Economics, sponsored by the Federal Oil Conservation Board brought out a number of particularly vital conclusions. Following are quoted statements taken from the report made to Chairman Ray Lyman Wilbur:

Automobile Loss

"In evaluating the probable domestic demand for motor fuel, it was concluded that the controlling factors were principally those of retrograding characteristics. From the best sources of information available, it was indicated that the average number of automotive units in use during 1932 would decrease approximately one million, a decline of over four per cent.

"The general historical trend of the domestic demand for motor fuel, with seasonal factors corrected has been definitely downward for some time, this condition having been indicated even as early as 1929, when it became apparent that the rate of increase in domestic demand was decreasing. . . . If the indicated tendencies persist, it is reasonably certain that the average decline thus projected will approximate five per cent.

"The committee has concluded that the principal factors causing the export demand for motor fuel to assume a pronounced downward trend will continue in effect during the period under consideration, but that the rate of decline in exports will be reduced due to the fact that the causaive factors of decline have almost exerted their full effect. The decreased purchasing power of foreign consumers and the pressure of competition from foreign motor fuel producers, together with foreign agreements concerning the source of supply, will continue to be the major factors influencing a decline in expost demand.

"In the best interests of conservation and the economic welfare of the industry, this committee suggests that the oil industry adjust itself to an approximate production of crude oil averaging 2,225,000 barrels daily for the entire nine-months period under consideration. If the fullest anticipations of demand for both motor fuel and crude oil, as now estimated by this committee, are realized, a reduction in crude oil stocks of 6,975,000 barrels will be accomplished. If legislation now pending before congress should lead to a reduction in imports of crude oil, it is suggested that production not be changed from the suggested 2,225,000 barrels per day, and that any added demand for domestic crude oil be met by withdrawals from storage."

The committee which prepared the Federal Oil Conservation Board report consisted of Martin Van Couvering, Howard Bennett, Sidney A. Swensrud, Clarel B. Mapes, with John W. Frey, chairman.

QUOTATIONS from the American Petroleum Institute Committee's report are also pertinent at this time. Among the remarks of this committee, made to the Board of Directors of the American Petroleum Institute were the following:

"While the two reports indicate a drop in domestic demand of about six per cent for the entire country, a fact which should not be overlooked is that in certain areas, particularly the Middle Western States, the motor fuel demand loss probably will exceed this average. Present information indicates that the loss in that area will be approximately 10 per cent.

"It also appreciates the extreme difficulty of forecasting in such chaotic times as at present, and recommends that especial attention be given to future re-

visions as they become available, for it is altogether possible that forces not now completely measurable may affect the consumption even more adversely than the present report indicates.

"In an effort to prevent having excessive stocks April 1, 1933, both committees show that additions to storage during the last quarter of this year should be considerably restricted.

"The two committees had to recognize a tendency of increased imports during the first three months of 1932, which they felt would continue during the early part of the period covered by their forecasts. They felt, however, that the imports during the entire period should be somewhat less than was actually imported during the 1931 period, and therefore indicated a materially decreased rate of imports during the last six months of 1932 in order to affect this reduction.

"The two reports contemplating a decline of somewhat less than seven per cent in total demand and taking as a basis the liquidation of inventories to working stocks arrive at substantially the same conclusion as to requirements of motor fuel production; namely, that it should be approximately 10 per cent below the amount produced during the corresponding period of the previous year."

The committee reiterates the conclusions stated in the report submitted at the St. Louis meeting in April, 1931, and again last November in Chicago, and quotes from those reports as follows:

"Throughout the recent experience of the industry it has become increasingly evident that the levels of stocks constitute the best single criterion of economic operation.'"

The American Petroleum Institute's Economic Committee consisted of W. C. Allen, H. R. Armour, A. H. Hand, Edward T. Knight, Charles H. McNeese, E. P. Salisbury, J. M. Sands, with Albert J. McIntosh and Fred Van Covern, chairman and secretary, respectively.

Arnott and Fales Elected To Institute Board

Tulsa.—Charles E. Arnott, president of Socony-Vacuum Corporation, New York, and leader in the international oil conference recently held in New York, and F. S. Fales, president of Standard Oil Company of New York, were elected directors of the American Petroleum Institute at a meeting of the board of directors held here in connection with the mid-year meeting of the organization. They succeed H. B. Earhart, president of White Star Refining Company, Detroit, and Charles F. Meyer, New York, recently resigned president of Standard Oil Company of New York.

Industry *Has Hope of Recovery*
"We Must Attack" . . *Beaty*

TULSA, JUNE 2.

CALL for an "attack" was sounded by Amos L. Beaty, president of the American Petroleum Institute, before the mid-year meeting at Tulsa, June 2. He quoted the famous words of Foch at the Marne:

"My center is giving way. My right is retiring. Impossible to maneuver. The situation is excellent, I shall attack."

The Institute president drew a picture of world industry, which he said was in distress, with petroleum "the one major industry that gives some promise of recovery." He pointed out the things that indicate recovery. This places a serious responsibility upon the petroleum industry, since it may by proper procedure become the core around which all industry will recover.

The threat of reduced consumption came into his remarks and he gave his personal opinion as "From what I have heard and seen I would, without any claim of satistical skill, estimate a decline of 15 per cent.

However, he countered with the advice that reduced consumption need not prevent recovery for petroleum since "we could, if we only would, make moderate profits on still lower consumption."

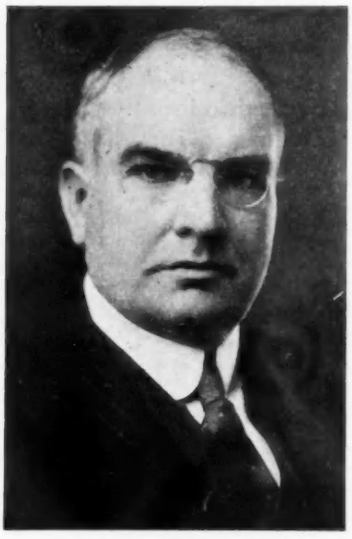
How price increases stimulate drilling was cited as one condition to watch. Revived drilling since price advances in April was pointed out.

Benefits of Control

Chief credit to the industry was summed up as "the affirmative fact that it has been possible to improve the industry and its earnings by artificial restraints upon crude oil production." The attitude of state conservation commissions, the decision of the United States Supreme Court in upholding the Oklahoma conservation statute and the prospect of an interstate oil compact were listed as assurances of further control over production by artificial means.

The climax of the Beaty message came with his exortation for further restriction upon production:

"Production at this time is too high. It must be reduced or our hopes will be blasted. Producers should not dally. For the United States, 2,000,000 barrels daily at this time should be the limit. Why does East Texas insist upon exceeding 325,000 barrels when the Railroad Commission has found production above that quantity results in waste of reservoir energy? Why does the commission fail to enforce its orders? Why do producers allow the matter to get out of hand? Is it proper to temporize with a thing so vital? Self interest is poorly served when relapse of the industry is invited. A few paltry dollars is nothing in contrast with a national calamity.



AMOS L. BEATY

"California must do something, and do it promptly, or else shoulder the responsibility for what may happen. The present is no time for mild words or soft sayings. If production in California is not soon brought under control we may expect at least to lose what we have recently gained through months of effort and California will be the greatest loser. If I am censured for making this plain statement, I can outlive the censure, and shall have the satisfaction of having done my duty by sounding the warning. The difficulties in California are fully realized. The sacrifices there made by some are fully appreciated. But there remains the stubborn fact that production is too high. It is a baffling problem, but not too severe for those who are mindful of its importance and their own responsibility. The slogan should be "attack."

"Even with California down to 450,000 barrels and East Texas down to 325,000 there will be more production

than present conditions warrant. Companies that are supposed to be sympathetic with efforts to stabilize the industry are lunging straight ahead to produce, in various pools producing all the oil they can, or all they are allowed to produce, seven days a week. They are to be found ranged along boundary lines, with other companies professing the same faith occupying offset positions, each straining every nerve to take out the last drop of oil at prices below the average cost of production. That much of the old order remains. It is susceptible to correction. Is the industry interested?"

Crude Production Controls

In answer to the proposition that troubles within the industry are due to refinery output he said.

"The unvarnished truth is that crude production controls and this can not be stated too often or in too many forms. Stalilization of crude production is, in my opinion, the one and only thoroughly effective remedy for excesses in refining and marketing. When it is placed and held at the proper level conditions will improve all the way down the line. I should like for the time to come when producers and not refiners or pipe lines post the prices."

Mr. Beaty decried the frequent statements that are made to "paint glowing pictures and tell of turning the corner. Do we desire to stabilize the industry? If so, shall we stabilize it where it was last December? Are we content to stabilize it even where it is today? The answer is that we must stabilize on a better basis. We must attack. If we merely try to hold, the forces of depression will subdue us. They will reach our channel ports. They will take our Paris. I am asking you to attack. Both crude production and refinery runs should be reduced."

Concerning the recent jump in imports, he explained: "The companies holding them, however, have openly stated that their policies will be not to dump these stocks but to hold them in storage here rather than in foreign countries. If they do not change their policies the effect should not be injurious, and if the duty becomes effective a substantial decline in imports can be expected thereafter."

Activities of the Institute in opposition to gasoline tax evasion as well as opposition to increased gasoline taxes were outlined briefly by Mr. Beaty. He voiced the opinion that the industry must continue both these efforts vigorously if it is to accomplish the tax reduction program that is essential for both the public and the industry.

A. P. I. Technical Program *All But* Deserted *for Economics*

SPENCER W. ROBINSON

TULSA, JUNE 3.

THE midyear meeting of the American Petroleum Institute, concluded here today, and called under the auspices of its three technical divisions, quickly became engrossed in the industry's economic trials and tribulations and all but lost its technical intent. Official and unofficial reports issuing from the prolonged sessions of the board of directors cast a decided gloom over what had started as an optimistic gathering.

Despite the well organized technical sessions and committee meetings, which embraced the consideration of the industry's major engineering problems the underlying current kept drifting to discussions more economic than scientific.

Following closely the announcement from Washington of the Senate's action in including special sales taxes on gasoline and lubricating oils, the directors took under consideration reports from the Voluntary Economics Committee of the Federal Oil Conversation Board and its own committee of refinery statistics which estimated minor decreases in the consumption on gasoline during the remainder of the year. exception was promptly taken to the detailed considerations of these economic bodies and announcements were made simultaneously with a petition to congress against the sales tax, that the industry would probably face a 15 per cent loss on consumption. This position of the directors met with opposition at the hands of the economists who elected to stand pat on their estimates of between 5.4 per cent and 6 per cent declines in consumption. The divided opinions were discussed and challenged in most every gathering whether in the official sessions or the more informal group meetings.

At the general sessions, participated in by all divisions, President Beaty, elected to digress from his prepared statement of the industry's condition, to emphasize what he designated in his opinion as the more serious problems of the tax situation at Washington and the decreasing market for gasoline. He said that the industry had made a strong fight against the inclusion of the special sales taxes levied on gasoline and lubricating oils and that while the action of the Senate was most unexpected that the industry and the institute were prepared to resume the fight with increased vigor and that the battle had not been lost. In commenting on the economic "Look-a-Head" of the two economic reports President Beaty said that while similar reports had in the past closely conformed to the actual results, that it was his opinion that while they represented at this time as accurate an estimate as could be made from the statistical facts in hand but that certain current conditions which he and certain members of the board of directors had observed and which could not be included in a consideration of the statistical facts, would materially alter the conclusions of the reports, and instead of the six per cent decrease in consumption indicated the industry would suffer a probable 15 per cent loss.

Charles F. Roeser, Fort Worth, chairman of the division of production, gave his report at this general session and urged that in view of the indicated loss in consumption that producers and refiners meet the issue with further curtailment in crude production and runs to stills. At a later appearance before a session:

Before the division of production Mr. Roeser reiterated his statements and said that the only hope for the producers was in adjusting drilling programs and production to a greatly reduced basis, predicated not only on current demands but also those indicated for the next two or three years.

A. P. I. Directors Make Protest on Oil Tax Levy

TULSA, JUNE 2.

Staggering under the shock of the Senate's action in passing the special sales tax bill aggregating $488,000,000 of which the oil industry is expected to provide $191,000,000, a dazed board of directors of the American Petroleum Institute, attending the mid-year meeting of the organization here, passed a resolution which it requested be read from the Senate floor, denouncing the bill as "an unjust imposition upon an already over-burdened essential industry."

The institute has waged a continuous war against the inclusion in the tax bill

of a sales tax of one cent per gallon on gasoline. A four-cent per gallon tax on lubricating oils and the special tax on pipe line transportation of oil. Having been successful in getting these measures struck out during the progression of the bill through the House and with assurance that they would not meet with the approval in the Senate, the industry had thought itself at least temporarily relieved of this worry.

The action of the Senate has brought the industry to arms again and the Institute's directors in their resolution have petitioned Congress "not to impose these burdensome taxes upon this industry, and again urges congress to strike out of the tax bill all of the sales taxes therein included and to substitute therefor a general manufacturers excise tax of approximately 1½ per cent, excepting food and clothing, which would yield approximately $500,000,000 and distribute the burden on an equitable basis."

Unit Operation *Considered in Institute* Technical Sessions

TULSA, JUNE 3.

THE program of utilization, more recently styled the "New Conception" was the basis for most of the deliberations before the technical sessions of the division of production at the mid-year meeting of the American Petroleum Institute concluded here today.

The unitization program was first approved at the annual meeting of the institute in Chicago last November and steps were immediately taken to develop an extensive organization of committees charged with the responsibility of collecting, devising and disseminating information designed to educate the industry and government toward the accomplishment of a general adoption of unit operation in the development of properties, the activity has immediately become the major effort of the division of production and the meeting just closed here witnessed, according to proponents of the movement, the realization of close to 100 per cent acceptance by those companies represented in the institute's activities.

J. Edgar Pew, one of the early advocates of the theory of oil in place, said that it was his opinion that at least 95 per cent of the industry had accepted the principles of the new conception with prospects that the other 5 per cent would be converted in the future.

Reports from the committee studying the problem of well spacing, a most important phase of unit development, indicate that considerable effort will be expended before anything of practical value can be determined in the proper methods of locating wells on a property or in a pool. However, a number of constants have been established as starting points in this theoretical study. A symposium on the subject was held at the first session of the division here in which aside from the reports of the chairman and sub-chairman, were presented some relative data on well spacing and results in such areas as California, Texas and New Mexico. Work on the subject will continue and results from further research will be presented at the annual meeting of the institute in Houston next November.

The geological aspects of unit operation were presented in a paper by Dr. F. H. Lahee, Dallas, under the auspices of the division's symposium on production policies at which also was presented a paper reviewing the laws affecting production in the principal producing states. The latter discussion was lead by John Kilgore, Wichita Falls, attorney, who suggested that the first step in attempting to get uniform oil legislation in the several producing states should be to get the conservation laws of these states to uniformly define and condemn waste.

Prepared technical papers presented before the division and published in full or in part elsewhere in this issue covered such interesting studies as rotary drilling fluids, prime movers, effect of ratable production on ultimate recovery, bottom hole pressures, operation of small wells and drilling and production practices in the Oklahoma City field.

In outlining the program of the two committees on drilling and production practices for the coming months it was decided that the industry would be sent a questionnaire asking for suggestions from which the programs can be developed. One subject which was referred to the committee on drilling practices was that of bit sizes with especial reference to California. The subject suggested by an article appearing in THE OIL WEEKLY, May 23, 1932, deals with the large number of bit sizes which are necessitated by the demands of operators for varying sizes of bits for drilling in the same size of casing. It was pointed out in the article developed by THE OIL WEEKLY that in California manufacturers are forced to stock around 84 sizes of bits whereas 23 should be sufficient. By reducing the number of sizes, the manufacturers claim a material saving could be effected by operating companies in drilling costs.

A committee has already been appointed in California to get consideration to this subject and reports will probably be available at the annual meeting in November.

Federal Taxes *on Oil Industry Become* Effective This Month

WASHINGTON, JUNE 3.

TAXES on imported oil will be in effect before the end of this month, it became assured with the completion June 2 of the conference committee's work on the new revenue bill. With the exception of asphalt and bitumen, on which the proposed tax of 10 cents per 100 pounds inserted in the bill by the senate has been deleted, the conferees accepted the senate rates on imports. The tax will be one half cent per gallon on crude oil, fuel oil, and all liquid derivatives of crude petroleum except lubricating oil and gasoline; two and one half cents per gallon on gasoline and other motor fuel; four cents per gallon on lubricating oil and one cent per pound on paraffin and other petroleum wax products. These taxes apply only to imports, but in addition domestic lubricating oil will be taxed four cents per gallon and there will be a tax of one cent per gallon on gasoline consumed.

While the rate of tax on imported oils, other than gasoline, is only half of the amount carried in the tax bill, the rate on gasoline is two and one half times as much, the house having provided a rate of one cent per gallon on crude oil, fuel oil and gas oil and gasoline.

The taxes on import oils and lubricating oil will be in effect until June 30, 1934, but the tax on gasoline consumption will expire on June 30, 1933.

It is anticipated that the measure will be accepted by house and senate without delay, probably being signed

by President Hoover early next week, making the taxes effective before June 25, it being provided that the levies shall take effect on the 15th day after enactment of the bill.

The measure carries a number of taxes which will affect organizations and individuals in the oil industry, aside from the normal individual tax rates of four per cent on the first $4000 of net income and eight per cent on the remainder, with surtaxes running up to 55 per cent on incomes in excess of $1,000,000, and the corporation tax rate of 14 per cent.

The oil industry will be particularly affected by the tax of three per cent upon electricity, used for either commercial or household purposes, which is to be paid by the consumer, and by the tax of two cents each on checks and drafts and the increase in the rate of postage on first-class mail to three cents per ounce.

The bill passed by the senate was estimated as raising $1,117,000,000 and it is believed the measure agreed upon in conference will come very close to that figure. In the majority of cases, where there was a difference between the house and senate drafts of the measure, the senate figures, particularly where higher, were retained.

Pan-Am Deal May Bring New Alignment *in South America*

NEW YORK, JUNE 3.

RECENT purchase of the Pan-American properties in Venezuela and Aruba by the Standard Oil Company of New Jersey has given rise to a number of interesting reports and rumors involving South American properties.

Apparently the purchase of the Pan-American properties, which include a big refinery at Aruba, will make it unnecessary for Standard Oil Company of New Jersey to go ahead with its previous plans to build a refinery on some island fairly adjacent to the pipe line terminus of the Andian Pipe Line Company on the Caribbean. From that terminus to Aruba is now only about two to two and a half days by tanker and from a standpoint of cost per barrel of oil handled, Columbian oil probably can be handled as cheaply from the pipe line terminus as Venezuelan oil can be handled from Maracaibo. It will not be necessary, in other words, to use light draft tankers to move the Colombian oil to the newly acquired Aruba plant.

Colombia's production was stepped up sometime ago in anticipation of the passage of an excise tax in the United States and is now running slightly under 57,000 barrels, of which about 53,000 barrels is going to export. This is a low cold test crude oil which yields a fair amount of gasoline of high octane rating—a kind of answer to the refiner's prayer, as it were. A bigger withdrawal than was anticipated at the first of the year may cause a disturbance of the drilling schedule of nine new wells for the year. Tropical Oil Company, the only producer of oil in Columbia, is operating on a very conservative basis with no wildcat activity this year.

What other effects the Jersey company's purchase of Pan-Am properties in Venezuela may have remain to be seen. There is considerable speculation as to who will head the Lago, and as to whether or not there will be a consolidated operation of Creole and Lago, the latter of which was a Pan-Am property while the Creole was a New Jersey proposition which operates in eastern Venezuela but which has considerable royalty interest around Lake Maracaibo. There seems to be an idea prevalent that here is a fine job for some nice young man.

Now that Pan-Am has sold out its Venezuelan properties rumor says that still another sale is probable. This writer has no facts to back up such a rumor, but it has been pointed out that the Venezuelan Gulf, which owns the Maritime strip, might find it good policy to trade its properties there to some company for properties elsewhere. Now, Standard Oil Company of New Jersey, owns the properties on one side of the Gulf and Shell owns the others. Such a trade would not be illogical.

East Texas Meter Order Is Issued

Austin, Texas.—Requiring that they be in operation within 30 days after June 1 when the order became effective, the railroad commission has ordered installation of meters on all pipe lines now moving oil out of the East Texas field. It is the first order of that nature ever issued by the body, and is designed to make proration more effective and to lessen possibility of oil thefts such as have been alleged in the past.

Owners of the pipe lines are required to purchase, install and operate the meters. A tolerance of two per cent error is permitted in readings of the meters, so that accuracy must be between 98 and 102 per cent. Representatives of the commission will check the meters occasionally to determine if they are functioning properly.

Selection of meters is left to the operators, but they may not use any type requiring installation of a bypass.

It is estimated that approximately 60 meters will be required in the field. As by-passes are banned, it is understood that Venturi and orifice type meters will be the only ones which will meet the requirements of the commission.

World Oil Conference Reaches *No Agreement*

NEW YORK, JUNE 2.

Conferences between officials of American and European oil concerns and representatives of the Russian government, looking to the stabilization of world oil markets, closed Thursday without accomplishment. The statement issued was to the effect that it had been found impossible to reach any agreement. Reasons were not given.*

The statement issued by C. E. Arnott, president of Socony-Vacuum Corporation, and Philip Rabinovitch of the Russian government was:

"The representatives of American and foreign interests in the export petroleum market who have been in conference during the past three weeks with representatives of the Soviet oil export organizations and who have together been carefully studying the problems created by the lack of balance between production and consumption, regret to announce that it has been found impossible at this time to reach any mutually satisfactory agreement toward the solution of these problems."

Mr. Arnott later said the conference had ended. Representatives of European oil companies sailed for home June 3. The Russian delegation will leave next week.

*See Page 43.

Texas Conservation *Statute* Decision *Held Up Thirty Days*

WM. V. GROSS
Staff Representative

Houston.—Whether the Texas Railroad Commission shall be shorn of its power to regulate production of oil in Texas by well proration, following closing of testimony taking and presentation of argument here before a three judge federal court May 30 to June 1, is a question that will rest with the judges until sometime in July. Regardless of whether the decision favors the anti-prorationists or the commission, appeal to the United States Supreme Court is anticipated, indicating further delay of several months before definite settlement of the question.

Following completion of arguments June 1, the court granted the plaintiffs (anti-prorationists) 15 days to file briefs and granted the railroad commission 15 days in which to file answers. Following the filing of the answers, the plaintiffs' counsel is granted an additional three days for filing an amended answer.

The opinion ultimately to be filed in Tyler, where the case originated, should, according to the argument of defendant counsel be decided upon the issue of whether the present order of the railroad commission is a reasonable order, that is, 54 barrels, or 59 barrels per well; whether the order permits of equitable distribution in East Texas, and whether the railroad commission has adopted a reasonable manner of handling waste in East Texas.

Complainants (anti-prorationists) argued the case should be decided upon the question of whether the railroad commission had violated and overstepped power given it by the legislature in the session occurring last summer after decision was rendered in the McMillan case; whether the railroad commission had acted as a deterrent to obtaining greatest ultimate recovery in East Texas by allowing only one well to each 20 acres; whether the purpose or the commissions' orders were in whole or in part illegal; whether present orders of the commission are confiscatory with reference to unequally advantageously located wells.

Those Involved

To avoid having several final judgments and appeals, five cases were grouped, the issue in all being the same. The six plaintiffs were represented by S. A. L. Morgan of Amarillo, who took the lead, the Saye brothers, attorneys of Tyler, and Byron A. Irwin of Shreveport. The railroad commission was defended by Assistant Attorneys General Upchurch and Cheek and R. E. Hardwicke of Fort Worth, attorney for the Texas Oil and Gas Conservation Association. The case was tried before Federal Circuit Judge J. C. Hutcheson, Jr., and District Federal Judges Randolph Bryant and William I. Grubb.

Proper styling of the cases involved in the general trial was as follows: (1) C. F. Smith, John W. Greer, J. S. Rushing, J. W. Clark, Incorporated, and J. H. Morgan—versus—Ross Sterling et al. (2) A. S. Palmer, J. G. Palmer and A. H. Tarver—versus— Ross Sterling et al. (3) Alfred McMillan, individually, Alfred McMillan, trustee, Jim McMurray, Dimham Oil Corporation, Gordon McMillan, trustee, Nat Wissman, and Pelican Natural Gas Company—versus Ross Sterling et al. (4) Bill and Dave Oil Corporation, Lide-Rowe Oil Company, Incorporated, Lide-Tayloe Oil Company—versus—Ross Sterling et al. (5) Peoples Petroleum Producers, Incorporated, K. E. Merren, individually, and K. E. Merren, trustee—versus—Ross Sterling et al.

Attorney Morgan of Amarillo opened for the plaintiffs charging in recitation of the high spots of his bill that some wells of his clients could be produced at from 1500 to 2000 barrels per day without waste. He alleged an attempt to control production with a view to market demand. He plead that his clients disposed of their oil to a regulated carrier; that the present allowable (59 barrels per well per day) is unreasonable and arbitrary; that present proration practices are in violation of the fourteenth amendment.

Upchurch's general denial specifically denied collusion and that the orders of the commission were issued for any purpose other than waste prevention.

Conservation or Market Control?

Arguments of the plaintiffs and testimony presented by them was in part, and perhaps primarily, intended to establish that control of production to market demand, and not conservation of a natural resource, was the real purpose motivating orders of the railroad commission affecting the per well allowable production. In attempting to develop this point, plaintiffs put great stress on the allegation that the per well allowable was cut from 225 to 180 barrels per day the same day that Governor Sterling and the railroad committee signed an expression of approval of the tri-state committee's (Oklahoma, Kansas and Texas) intention to hold production to market demand.

Plaintiffs also introduced testimony to show that some orders were issued without hearings as prescribed by the act, arguing such action was arbitrary. An important part in the development of this point was a deposition of Lon Smith, commissioner, parts of whose deposition were filed as evidence by both sides. R. D. Parker, chief supervisor, admitted on the stand that up to August 12, 193[illegible] orders of the railroad commission were promulgated to hold production to market demand.

Attorney Morgan got Parker to state that the per well allowable in East Texas was changed to 54 barrels per day without quizzing any witnesses or taking any testimony, qualifying with the statement that the step was justified by cumulative evidence, but testifying a few minutes later that 50 wells in East Texas are without connections.

In the attempt of plaintiffs to show further that control of production was the real purpose of the commission, an affidavit was produced stating in effect that if a producer sold waste oil at less than posted prices, he was forced by the commission to count that oil as part of his allowable, but that if the producer burned the waste oil, he was not forced to count it as part of his allowable.

Judge Randolph Bryant, commenting on this phase of the case, remarked to counsel of both sides, "It looks like, in the present control of production, that prevention of waste is incidental to control of market price."

Judge Hutcheson further contributed to the discomfort of both sides by asking, "Suppose the court were to reach the conclusion that the real purpose of curtailment is economic?"

"What of it? What of it if a better price was in the back of the operators' minds?" countered Hardwicke in his final argument for the defendants. "You (the court) can't find evidence in the testimony presented here to empower you to declare that the railroad commission has violated the act of the legislature." Addressing the three judges he heatedly declared, "You say control of production to market demand is illegal, but the United States Supreme Court says you are wrong. Price fixing doesn't enter into it. If the court finds that the railroad commission has found waste, and that the commission has adopted a reasonable manner of handling that waste, then it is up to this court to uphold the railroad commission's action, whether that action helps the price of oil or not."

Morgan's closing argument attacked Hardwicke's application on the decision in the Champlin case, saying that the de-

cision refers to Oklahoma's statutes in relation to proration, whereas this court must consider the constitutionality of the railroad commission's actions with reference to Texas statutes, the former permitting control of production to market demand, the latter expressly prohibiting it. Morgan took the stand it was fundamental that the court could not tolerate as legal an act the purpose of which was illegal.

New Attitude on Gas-Oil Ratio

One of the surprising features of the trial was the attitude of the railroad commission and expert witnesses for the defendants on the importance of gas-oil ratio control of production with respect to conservation of a natural resource and greatest ultimate yield.

J. H. Clarke of Amarillo, witness for defendants, testified he never had thought gas-oil ratio was very important with respect to ultimate recovery. Charles V. Millikan of Tulsa, defendant expert witness, testified under cross-examination he thought gas in solution in oil had nothing to do with producing the oil, that is, getting it to the surface. R. D. Parker testified, "Control of East Texas production by the railroad commission does not take into consideration the oil and gas ratio." Assistant Attorney General Upchurch argued, "It would be impossible, practically, to test each well in East Texas field to determine its correct gas-oil ratio."

Plaintiffs in the case, however, took a different stand on the gas-oil ratio, touting the commission's disregard of the gas-oil ratio, and the alleged declaration of the commission or member thereof that it had found out in the past two weeks gas-oil ratio did not mean anything in East Texas. Attorney Morgan argued the commission took this stand because it knew that if the wells were produced at a proper rate with respect to gas-oil ratio, production in East Texas would be too great for market demand. In furtherance of this stand, the plaintiffs' counsel drew from Ralph Arnold of Los Angeles, expert witness, the statement that 54 barrels per well "is only a small portion of the oil that would be produced by the average well in East Texas if such well were produced scientifically and as generally produced by petroleum engineers—that is, with a proper gas-oil ratio." Mr. Arnold further testified, "If you produce a field at the proper gas-oil ratio, you will produce it in the most non-wasteful manner."

W. T. Saye of Tyler, attorney for plaintiffs, in the opening argument stated that the Texas oil and gas conservation law expressly gives the commission right to determine the correct gas-oil ratio of a well and to prohibit use of a greater ratio on that well. He argued the state had not taken this into consideration in East Texas, making inference to the admission under Morgan's cross examination by Parker that the only way to determine proper gas-oil ratio was by individual well test. Attorney Saye argued more on the point to the tenor that Section 7 of House Bill 25 give the commission right to prorate and curtail only those wells yielding waste, and that right after Section K is a provision that the commission shall not have the right to curtail a well which is not responsible for waste.

Channeling or Coning

Channeling and coning, two results of too rapid encroachment of water upon the producing horizon, came in for considerable testimony and demonstrations on the part of both parties to the suit, expert witness for the commission testifying both would result from a daily production of more than 325,000 barrels per day.

On this part of the suit, the state presented by testimony and a demonstration barred as evidence almost an air tight case on probable effects of producing the field fast enough to allow trapping of the less porous and less pervious sands by water.

One of the state's witnesses on channeling was E. O. Buck of the commission who has been employed in checking water levels. Judge Hutcheson took the witness in hand and asked him if there was a way to prevent channeling. "Yes, sir," replied the witness. "Has it ever been done?" asked the judge. "No, sir." Mr. Buck further testified, "I have produced one well at the rate of 100 barrels per hour and got a 70-pound drop in pressure of the offset well." The witness also testified that fast flow results in paraffin and b.s. accumulation in tanks.

When the plaintiffs took charge of the witness they got him to admit that paraffin and b.s. would accumulate at the rate of 59 barrels per day also, and that Kilgore, the area where the heaviest withdrawal of oil had taken place, had not suffered from water encroachment, and that the Overton area, developed largely in accordance with the commission's orders, had suffered more from water than any other area.

Expert Testimony

On the subject of water intrusion, C. V. Millikan of Tulsa gave the jurist something to ponder over when he testified, "Even though the water rushes in, its movement is very slow." The court was restored to order shortly.

Testimony of K. B. Knowles, petroleum engineer of Bradford, Pennsylvania, was generally discussed as being a great aid to the commission's cause. Mr. Knowles outlined artificial flooding in the Bradford field which is allowing recovery of much oil that has been considered "dead" oil. He explained how East Texas could be flooded naturally by regulated control, by retarding production and applying back pressure.

It was the handling of this issue of the case, perhaps, that moved Judge Hutcheson to declare that he thought the state had made a very strong case and that the

Tighten Rules *on Handling Production in* East Texas

Austin, Texas.—Designed to further regulate handling of crude oil in the field and to constitute additional preventive against excessive withdrawals from any lease, the railroad commission effective May 28 issued a special order for the East Texas field adding three new regulations to those in the April 30, 1932, order. The new rules are numbered 34, 35 and 36.

Rule 34 stipulates that "All flowing wells shall be equipped with a 500-pound spring pressure gauge on both tubing and casing. Gauges shall be so installed as to show both flowing and shut-in pressure. At least one flowing and one shut-in pressure shall be recorded from each gauge every day."

Under Rule 35 uniform daily reports are required from every purchaser, transporter and refiner owning or operating gathering lines, pipe lines, refineries, loading racks or tank cars or oil trucks in the district. These reports are required on and after June 15. The commission will furnish the forms, which shall show daily receipts and deliveries, and stocks of crude on hand. The reports will be itemized to show the name of the owner or operator, the name of each lease, number of wells on each lease, and other data of similar nature. Monthly reports will also be required to give the same information.

Under Rule 36 refineries operating in or near the field will be required to install a sufficient number of storage tanks to enable them to run oil from one unit while other units are being filled.

plaintiffs had made a weak one in the presentation of testimonial facts, and to point out in the next breath that notwithstanding the testimony maybe the court feels it knows, in effect, that the real cause of the commission's action is production control.

In connection with presentation of vast evidence on water encroachment by expert witnesses for both sides, the case had two apparently hopeless aspects. One appeared whenever plaintiffs' counsel tried to get anything helpful out of cross-examining E. V. Foran, expert for the commission. The other hopeless situation arose when counsel for the commission tried to get anything helpful out of Ralph Arnold, expert witness for the plaintiffs. Yet Foran and Arnold differed right down the line on many points of major importance concerning characteristics of gas, pressures, and oil drives.

"Why is it," Judge Hutcheson asked, "that two men recognizing each other as highly trained and competent scientists in petroleum engineering can make such opposed statements concerning these gases?"

"I think it is because Mr. Foran has forgotten some of what he has learned," answered Mr. Arnold.

Mr. Arnold's testimony on trapping or channeling was, "Channeling or trapping of an oil sand merely is a result of spacing the wells too far apart. Close spacing is more preventive of waste. Far spacing is very wasteful so far as ultimate recovery is concerned."

Popularity of Proration

Sworn affidavits and oral testimony were presented by plaintiffs to show dissatisfaction of operators with the well allowable scheme. Affidavits and testimony to show the contrary were presented in greater volume by the defendants. It was during the attempt to prove whether proration was popular that one of the humorous situations of the trial developed.

R. J. McMurray, independent producer, called by the state, testified a well owned by him and Mr. McMillan had gone dead before military shut-down because it had been produced at an excessive rate. He further testified he was in favor of the present proration arrangement.

W. T. Saye took charge of Witness McMurray for the plaintiffs, and got him to admit that he might have said since arrival in Houston for the trial something to the effect "That if East Texas oil was as much as 98-cents a barrel, he'd be in favor of opening up the field." The judge had to call the court to order.

In trying to support arguments that the commission had violated the fourteenth amendment, the plaintiffs introduced Dave Lide of Shreveport who testified he had been selling his oil to Atlas Pipe Line Company, a regulated carrier which pumped the oil out of state. Plaintiffs argued also that any law which makes a man produce his well at such a low rate that it will never pay out is not constitutional.

The Equity of Proration

Much was said on both sides about the equity of proration enforcement—whether it was fair to holders of large and small leases, whether it was fair to those who had wells excellently and poorly located as to structure. W. F. Knode, petroleum engineer with the commission, testified that a group of closely spaced wells would tend to create a low pressure area around them. Plaintiff counsel urged this was inequitable so far as those wells were located one to 20 acres were concerned. Buck of the commission testified the owner of an 8000-barrel well and the owner of a 500-barrel well both would derive benefit from a 59-barrel per day allowable so far as ultimate recovery from these wells was concerned. Some other witness testified in the same manner, i. e. that the little well owner and the big well owner would, under railroad commission administration, get more ultimate production, whereupon Judge Hutcheson remarked, "The millennium is here."

After stating that he thought the 59-barrel allowable was an effective figure for practical purposes, E. S. Durward of Dallas testified that it would be dangerous for the railroad commission to try to obtain actual potentials on the East Texas wells. On the other hand, Mr. Arnold testified it was not possible to set one figure as the allowable for every well in the field without creating individual instances of waste, and Attorney Morgan, in closing for the plaintiffs, argued, "It is unlawful to say that a man owning a well capable of producing 10,000 barrels a day without waste shall produce that well at only 54 barrels per day."

Control of Field Argued

Another crazy quilt of testimony was presented by the experts of both sides as to whether East Texas was a water drive or a gas drive field, whether it was under volumetric or hydraulic control, whether laws of capillarity obtained. The water drivers seemed to carry the day. T. B. McGaha of Wichita Falls, originally introduced by the plaintiffs, said he believed the field under hydraulic control, that if the hydrostatic head were maintained at 1600 pounds it would be enough to drive every drop of oil out of the field. Mr. Millikan testified the field was under a combination of volumetric and hydraulic control.

Mr. Arnold testified, "Gas is the propulsive force. Water has very little to do with it except at the point of its contact with the oil at the outer edge of the producing horizon. I believe a greater portion of the sands in East Texas are more subject to the laws of capillarity than to laws of hydrostatics. Water drive in East Texas has not been effective since the first few days of significant production, and never will be again at the present figure of 325,000 barrels per day, or even much lower. As to control, the field is under volumetric control."

Gas Waste?

Plaintiffs attempted to establish the commission had allowed gas waste in East Texas by introducing testimony to the effect that an increased gas-oil ratio resulted from flowing the wells only a small portion of 24 hours, whereupon the state proved fairly conclusively that data to support this testimony of plaintiffs were obtained by inaccurate methods. Much ado was made by plaintiffs of the free gas which accumulated in tubing while the well was not producing and the waste of that gas when the well was put back on production to obtain the day's allowable. Mr. Foran's testimony on this question was, "Any statement regarding extreme waste of gas can not but indicate a lack of understanding of conditions as they are." This followed testimony to the effect that gas accumulated in the tubing of all the wells each night had a very small intrinsic value.

Plaintiffs further attempted to establish by affidavits that the gas-oil ratio decreased as the production on some wells increased, and that pressures on nearby wells were not necessarily affected by opening, partially, certain wells, and that some wells actually built up pressure when allowed to flow at several times the allowable.

In answering testimony and arguments of plaintiffs indicating a lack of consistency on the part of the commission in its methods of preventing waste throughout the state, by using in some places potentials, in some gas-oil ratios, in some per well allowables, Upchurch, in his closing argument stated, "The railroad commission is a baby so far as prevention of waste in the oil business is concerned. That baby must crawl before it can walk."

Tyler, Texas.—The five-barrel reduction in the allowable production per well in the East Texas field placed in effect by state authorities June 1, permits a maximum of 54 barrels daily from each producer. Wells adhering to this schedule, and commanding the field's posted price of 98 cents per barrel have a gross earning power of $52.92, or $46.30½ daily after the usual one-eighth royalty is deducted. Other fixed charges, such as an average deduction of two per cent, by pipe line companies, taxes and lease overhead lower the figure somewhat below that given above.

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RB-2

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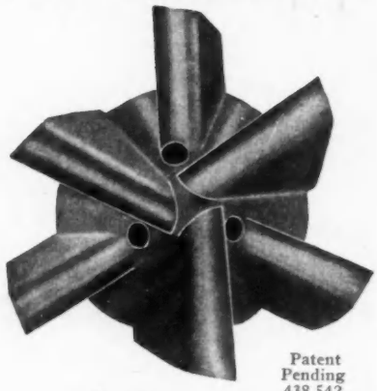
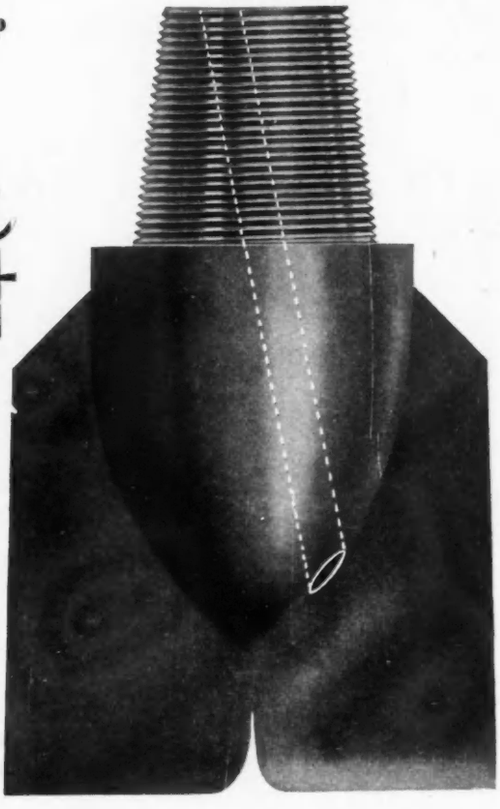


Patent Pending 438,542

End View



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MARKETS—STATISTICS

Crude Output Continues to Decline. Texas Purchasers Curtail Takings in Effort to Stabilize Prices.

H. J. STRUTH, *Staff Economist, Houston, Texas*

Production Shows Stability; Outlook Improves

CRUDE production continues to hold at a steady level with the daily average below 2,200,000 barrels. Last week's output showed a daily average for the United States of 2,184,397 barrels against 2,163,145 barrels in the preceding week. The increase of 21,000 barrels represented gains recorded by East Texas and Seminole, Oklahoma. Present production is nearly 300,000 barrels a day below the level recorded at this time last year. Notable changes made since then are reflected by substantially lower output in Oklahoma, Kansas, California and Texas. It is significant also to note that East Texas' production is at practically the same level recorded at this time last year; about 350,000 barrels a day.

A further slight decrease in production of California last week to a daily average of 483,500 barrels, makes it appear certain that success will attend efforts to bring state output down to the allowable of 476,700 barrels a day. Former difficulties have apparently been eliminated to the extent where a majority of operators are expected to do their part in preventing over-production. With the exception of a few fields like Long Beach, Ventura Avenue, Dominguez and Seal Beach, production is being pinched back effectively in the larger fields. Rumors to the effect that realization of curtailment to the allowable production figure will result in higher crude prices are not without foundation.

Oklahoma production moved to a slightly higher level last week, from 398,090 barrels daily to 414,500 barrels daily. Yet, last week's production was well within the allowable for the state of 443,655 barrels. Seminole reported an increase in production last week of about 16,000 barrels a day, the average for this area being 141,985 barrels a day, against 126,490 barrels in the preceding week. Oklahoma City output was practically unchanged, at a daily average of 81,000 barrels. Kansas production continued steady at a daily average of 95,975 barrels, compared with 96,275 barrels in the preceding week.

East Texas reported increased production last week, with a daily average for the area of 346,000 barrels, compared with 339,700 barrels in the preceding week. With close to 6000 wells in the East Texas field, it is apparent that production restrictions are being observed most effectively. Still, developments continue to pile up new records in well completions every week. Last week, 187 wells were completed in East Texas, of which 185 were reported as good producers. Production in the Texas Gulf Coast moved up to 113,400 barrels a day last week, exceeding the recently ordered allowable by about 6000 barrels a day. Other districts of Texas showed practically no change last week. State output amounted to 881,215 barrels daily, representing an increase over the preceding week of less than 9000 barrels a day.

Louisiana output dropped about 4000 barrels a day last week, as a result of lower output in the Gulf Coast area. The latter section reported a daily average production of 33,600 barrels, against 37,200 barrels a day in the preceding week. Arkansas' production was practically unchanged. Little change was recorded by Rocky Mountain states or by Eastern States.

THE OIL WEEKLY

Estimated Daily Average Production Week Ending June 4, 1932

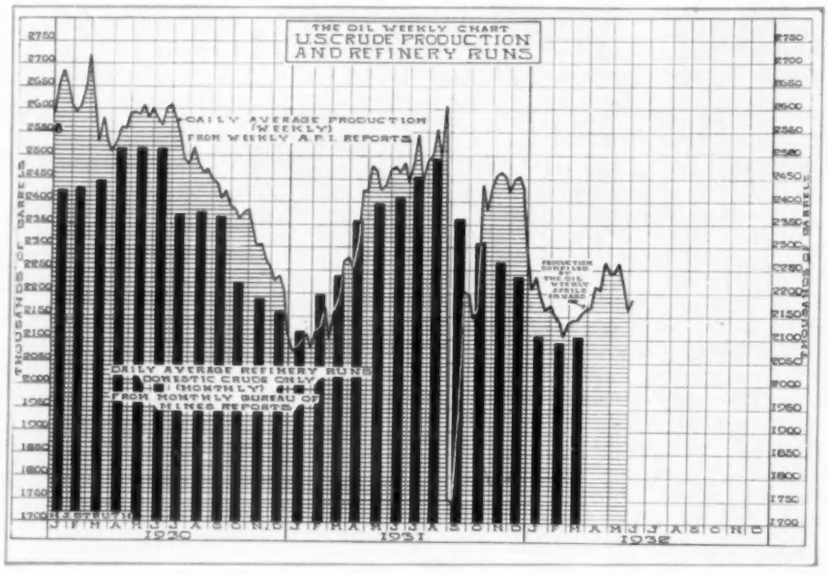
	For Week June 4	Ending May 28
Texas Panhandle	51,650	52,750
North and West Central Texas	74,675	74,480
West Texas	181,200	180,690
East Central Texas	56,650	56,400
East Texas	346,000	339,700
Southwest Texas	57,640	56,075
Total Texas, Outside of Gulf Coast	767,815	760,095
Texas Gulf Coast	113,400	112,600
Total Texas	881,215	872,695
Oklahoma City	81,000	83,200
Seminole	141,985	126,490
Other Oklahoma	191,515	188,400
Total Oklahoma	414,500	398,090
Ritz-Decker	12,420	12,740
Voshell	6,530	6,300
Other Kansas	77,025	77,235
Total Kansas	95,975	96,275
North Louisiana	28,052	28,350
Louisiana Gulf Coast	33,600	37,200
Total Louisiana	61,652	65,550
Arkansas	34,300	34,500
Long Beach	76,500	76,000
Santa Fe Springs	61,000	62,000
Midway-Sunset	49,000	50,000
Kettleman Hills	60,000	57,300
Other California	237,000	†240,700
Total California	483,500	†486,000
Wyoming	38,210	38,970
Montana	8,640	7,960
Colorado	3,310	3,100
New Mexico	35,645	35,255
Total Mountain States	85,805	85,285
Eastern States	127,450	124,750
Total United States	2,184,397	†2,163,145

†Revised

Price Structure Gaining Strength

FOR the first time in many months, the market situation in California presents a bright outlook. Reduced crude production, to a point only slightly above the revised allowable, has started widespread anticipation of higher crude prices there. In fact, if production is maintained within present limits there is every reason to believe that higher prices will materialize soon. The only phase of uncertainty in California's market situation is the competitive status of retail gasoline. Third grade gasoline prices have been reduced lately and the general retail price structure is still far from stable. Yet, many believe that an advance in the California crude market would do much to alleviate price-cutting in the gasoline market. Refinery prices in California have apparently shown more steadiness during recent weeks than has been apparent for some time. However, there are still numerous sources of low-priced supply arising from excessive production of crude sold below the prevailing market prices.

The reversal in the gasoline price trend in the Mid-Continent has apparently been arrested and the wholesale gasoline market is showing a steady tone. Increased shipments have undoubtedly saved the day for Mid-Continent refiners, since runs to stills have been above normal. The kerosene market, however, has begun to show the effect of slackening demand and prices are sagging. On the other hand, demand for cracking stock has shown


THE OIL WEEKLY CHART
U.S. CRUDE PRODUCTION AND REFINERY RUNS
DAILY AVERAGE PRODUCTION (WEEKLY) FROM WEEKLY A.P.I. REPORTS
DAILY AVERAGE REFINERY RUNS DOMESTIC CRUDE ONLY (MONTHLY) FROM MONTHLY BUREAU OF MINES REPORTS
THOUSANDS OF BARRELS
1930
1931
1932

improvement and prices for gas oil have firmed considerably.

The Mid-Continent crude market continues to hold firm, with uncertainties of a few weeks ago disappearing. If refinery runs are cut back sufficiently to prevent further weakening of the gasoline market, the crude price structure will undoubtedly hold firm throughout the summer. Yet, if crude production is brought down to a lower level, there is reason to believe that another price advance could easily materialize. In fact, a higher price for crude might help to prevent excessive runs of crude through refinery stills, whereas a drop in crude requirements would be offset to a large extent by increased value of crude production.

The demand for gasoline continues to run somewhat below that of last year, but the industry will undoubtedly make a better financial showing on its present volume of business than was the case last year. It was at this time last year that the gasoline market turned sharply downward and prices receded to the lowest levels of the year. Present wholesale gasoline prices are from 1¼ to 1¾ cents above the quotations in effect at this time last year, which means a lot in terms of gross revenue, despite the fact that consumption is under last year. There are still a number of uncertainties in the refined oil market situation that can only be eliminated by a program of general production curtailment. Upon the outcome of such procedure depends the market outlook for both crude and refined products. Imposition of another cent to the already heavy gasoline tax burden, as a part of the program of balancing the government budget, is not expected to help the sale of gasoline.

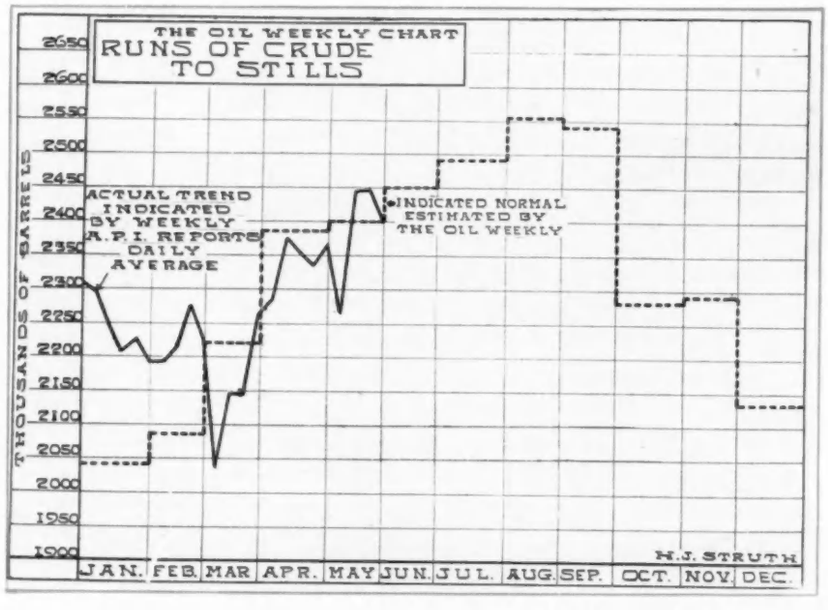
Purchases Reduced to Uphold Price Structure

MATCHING of crude purchases with requirements on a virtual day to day basis is becoming a stern policy with leading buyers in Texas. Many companies are taking advantage of opportunities to reduce purchases of outside oil in order to liquidate stocks while the present price prevails. That such a policy exists is becoming more in evidence as orders are passed out for reductions in purchases in second choice crudes in West Texas, in the North Texas stripper well areas, and in East Texas. Pipe line connections are becoming more difficult to obtain in the East Texas field even though the daily output of the field has been held close to 325,000 barrels.

These developments do not indicate an early revision in the price structure, but indicate that buyers are adjusting their affairs to make the current price secure for the balance of the summer. Care is being taken, not to curb purchases to such an extent that the local price structure will collapse.

The North Texas district is developing a soft market tone because of partial withdrawal of market support by majors, and the curbing of runs to stills by local independent refiners because of inability to finance plant operations. Financial backing for plants unable to register a profit on operations is no longer possible.

Crude at distress prices is available in North Texas. The Panhandle Refining Company announced effective June 1 it would pay the posted price for crude at the well, but producers must bear the cost of transportation, which averages about 15 cents per barrel. This buying plan will enable some operators that have been deprived of a market by retrenchment buying pro-


THE OIL WEEKLY CHART
RUNS OF CRUDE TO STILLS
ACTUAL TREND INDICATED BY WEEKLY A.P.I. REPORTS DAILY AVERAGE
INDICATED NORMAL ESTIMATED BY THE OIL WEEKLY
THOUSANDS OF BARRELS
JAN. FEB. MAR APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC.
H.J. STRUTH

Crude Runs to Stills, Gasoline, Gas & Fuel Oil Stocks

(Barrels of 42 gallons)
Week ending May 28, 1932

District	Crude Runs to Stills Total	Crude Runs to Stills Daily Average	Crude Runs to Stills Per Cent Operated	Gasoline Stocks (See Note Below)	Gas & Fuel Oil Stocks
East Coast	3,371,000	481,600	76.0	6,515,000	6,420,000
Appalachian	693,000	99,000	72.1	1,721,000	1,035,000
Ind., Ill., Ky.	2,031,000	290,200	67.3	6,318,000	4,029,000
Okla., Kans., Mo.	1,643,000	234,700	53.9	4,009,000	3,310,000
Texas	3,843,000	549,000	71.7	7,788,000	9,138,000
Louisiana-Arkansas	1,184,000	169,100	73.4	1,840,000	4,653,000
Rocky Mountain	256,000	36,600	25.5	2,047,000	660,000
California	3,214,000	459,100	51.9	14,099,000	97,415,000
Total week of May 28	16,235,000	2,319,300	63.3	44,337,000	126,660,000
Total week May 21	16,551,000	2,364,400	64.6	44,703,000	125,546,000
Total May 30, 1931	17,322,000	2,474,600	69.3	44,160,000a	129,463,000
The Texas and Louisiana Gulf Coastal Figures shown below are included above in the totals of their respective districts.					
Texas Gulf Coast	3,089,000	441,300	83.0	6,207,000	6,245,000
Louisiana Gulf Coast	813,000	116,100	78.7	1,670,000	3,883,000

Note: Stocks at refineries, except in California district, which includes stocks of finished gasoline and engine distillate at refineries, water terminals and sales distributing stations and amounts in transit thereto.

(a) This figure is not entirely comparable with current stocks due to revisions made since original publication of this figure, for which revisions the basic information is not available by weeks. If it were possible to have made the revision, the new figure would reflect somewhat lower stocks.

grams by majors and some independent plant owners to gain relief. The Waggoner Refining Company has offered to relieve the unserved properties in Wilbarger County of their predicament by running the proration allowance, but paying for only 65 per cent of the total, then store the remaining 35 per cent at three cents per barrel monthly rental. This is directed at about 1400 barrels of settled production held by Phillips Petroleum Company, Shell Petroleum Corporation and others. These properties have been served by Stanolind Crude Oil Purchasing Company under a temporary arrangement with The Texas Company, and The Texas Pipe Line Company has the only lines connected. The Texas Company was not interested in resuming purchases when Stanolind withdrew. The Waggoner Refining Company's proposition is probably the only alternative for the producers involved. A small volume of settled production in Foard County has also been threatened with loss of its regular market unless a crude exchange arrangement can be perfected.

Gulf Pipe Line Company is apparently to live up to its announced intentions of surrendering about 1800 barrels of stripper production in Wichita and Archer Counties that was formerly handled by The Texas Pipe Line Company, Continental Oil Company and others. A portion of this oil was taken on 30-day cancellation, and the remainder on 90-day contracts. Notices were issued late in April by Gulf Pipe Line Company of its intentions to surrender all, except for the deep production in the Chalk Hill pool, Archer County.

The forecasted slush in the allowable production for the Howard-Glasscock County district, West Texas, proved greater than expected beginning June 1. Shell Petroleum Corporation lowered its nominations from 5000 to 3500 barrels, and the Howard County Refining Company quit operating, thus accounting for another 1000-barrel loss. Humble Oil & Refining Company indirectly added to the decrease by declining to scatter its purchases over a greater number of leases when the general reduction in proration allowance for the field reflected the action of the above two companies. The field is allowed a maximum of 18,000 barrels daily in June, 3000 barrels below the May quota.

Summarized Review of Field Results

	Completions	Oil Wells	Gas Wells	Failures	Initial Prod.
Arkansas	3	0	0	3	0
California	4	2	0	2	500
Illinois	1	1	0	0	2
Indiana	0	0	0	0	0
Kansas	8	6	0	2	1,571
Kentucky	15	8	3	4	900
Louisiana	17	4	2	11	1,010
Michigan	4	3	0	1	1,650
Mississippi	1	0	1	0	0
New Mexico	1	0	1	0	0
New York	0	0	0	0	0
Ohio	16	7	3	6	111
Oklahoma	25	16	4	5	12,203
Pennsylvania	2	2	0	0	55
Texas	259	209	3	47	1,594,722
West Virginia	7	2	5	0	14
Miscellaneous	0	0	0	0	0
Totals	363	260	22	81	1,612,738

Still Runs Cut; Gasoline Stocks Down

STOCKS of gasoline were more substantially reduced last week as a result of cutting back still runs to a more normal rate. Stocks of gasoline recorded a decline of 366,000 barrels, a daily average of over 52,000 barrels, whereas in the preceding week gasoline stocks only declined 95,000 barrels, a daily average of less than 14,000 barrels. On the basis of figures reported to the American Petroleum Institute for the week ending May 28, it is apparent that runs to stills of all refineries amounted to a daily average of 2,402,000 barrels. This represents a decline under the preceding week of about 47,000 barrels a day.

It will be seen by the accompanying chart that runs are again at a more economic level, the present daily throughput being conducive to withdrawals from excessive stocks. A study of previous results and a forecast of future demand for gasoline seems to point to the need for a further reduction in the rate of crude throughput.

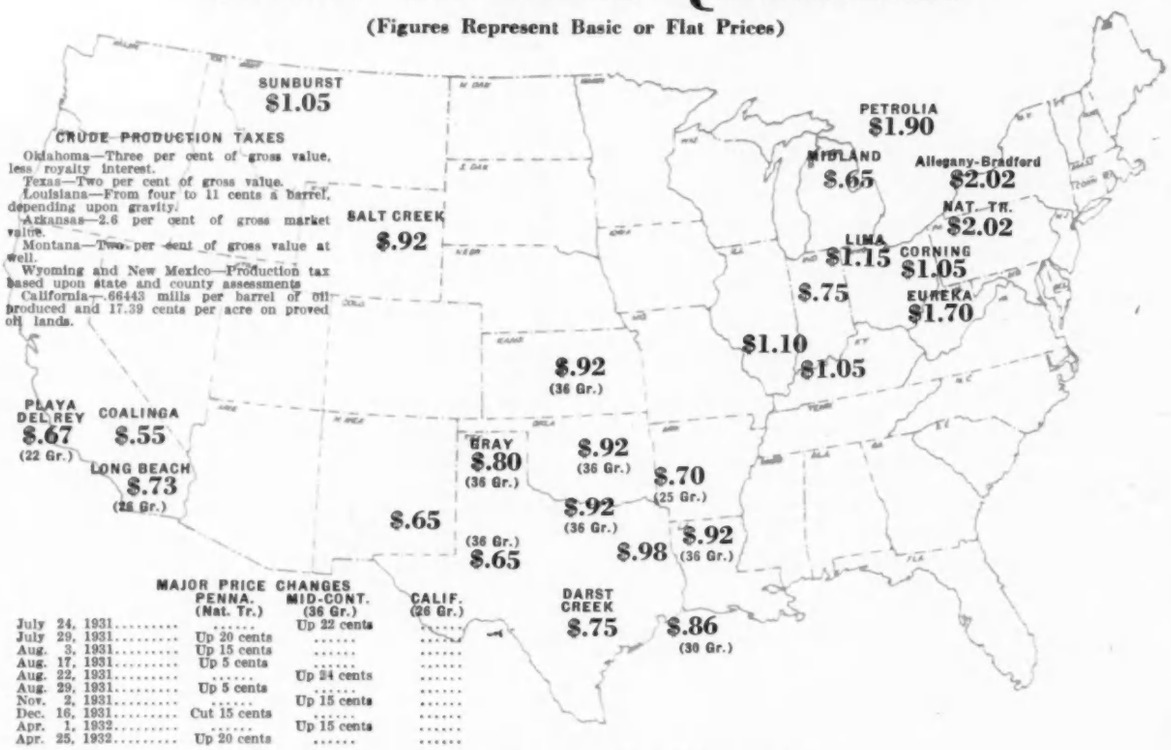
In view of discouraging reports being received from various refining centers, which indicate substantial decreases in demand for gasoline, steps need to be taken to curtail operations to a less hazardous level in order to insure market stability throughout the season of peak demand.

Comparison of Permits Granted for New Wells

	For week June 6	Total month	Total this year	Total this date year	1931 total
Arkansas	0	0	8	23	34
California	5	5	149	195	342
Louisiana	3	3	192	158	309
Kansas	17	17	251	210	475
Oklahoma	23	23	454	457	842
Texas	258	258	3,593	2,433	6,961
Totals	306	306	4,645	3,476	8,963

Crude Oil Price Quotations

(Figures Represent Basic or Flat Prices)



CRUDE PRODUCTION TAXES

Oklahoma—Three per cent of gross value, less royalty interest.
Texas—Two per cent of gross value.
Louisiana—From four to 11 cents a barrel, depending upon gravity.
Arkansas—2.6 per cent of gross market value.
Montana—Two per cent of gross value at well.
Wyoming and New Mexico—Production tax based upon state and county assessments
California—.66443 mills per barrel of oil produced and 17.39 cents per acre on proved oil lands.

MAJOR PRICE CHANGES

	PENNA. (Nat. Tr.)	MID-CONT. (36 Gr.)	CALIF. (26 Gr.)
July 24, 1931	.....	Up 22 cents	.....
July 29, 1931	Up 20 cents	.....	.....
Aug. 3, 1931	Up 15 cents	.....	.....
Aug. 17, 1931	Up 5 cents	.....	.....
Aug. 22, 1931	.....	Up 24 cents	.....
Aug. 29, 1931	Up 5 cents	.....	.....
Nov. 2, 1931	.....	Up 15 cents	.....
Dec. 16, 1931	Cut 15 cents	.....	.....
Apr. 1, 1932	.....	Up 15 cents	.....
Apr. 25, 1932	Up 20 cents	.....	.....

Official Postings and Differentials

(Revised to June 3, 1932)

California: (Effective June 19, 1931.)

Signal Hill, Seal Beach and Alamitos Heights: 14 to 22.9 gravity 65 cents; 23 gravity 67 cents with differential to two cents for each degree upward. Top price for Signal Hill, 30 gravity, 81 cents; top price Seal Beach and Alamitos Heights, 27 gravity, 75 cents.

Huntington Beach: 14 to 21 gravity, 65 cents; 22 gravity, 66 cents with differential of two cents for each degree upward. Top price, 27 gravity, 76 cents.

Inglewood: 14 to 19.9 gravity 65 cents; 20 gravity 66 cents with differential of two cents for each degree upward. Top price, 25 gravity 76 cents.

Playa Del Rey: 19 to 20.9 gravity 65 cents with differential of one cent for each degree upward. Top price, 25 gravity, 70 cents.

Olinda and Brea Canyon: 14 to 19.9 gravity 65 cents; 20 gravity 66 cents; 21 gravity 67 cents; 22 gravity 68 cents with differential of two cents for each degree upward. Top price, 28 gravity, 80 cents.

Coyote Hills: 14 to 22.9 gravity 65 cents; 20 gravity 66 cents; 21 gravity 67 cents with differential of two cents for each degree upward. Top price, 28 gravity, 79 cents.

Santa Fe Springs: 24 to 26.9 gravity 65 cents; 27 gravity 68 cents; 28 gravity 71 cents; 29 gravity 73 cents; 30 gravity 75 cents; 31 gravity 78 cents; 32 gravity 80 cents; 33 gravity 83 cents; 34 gravity 85 cents; 35 gravity and above 87 cents.

Whittier, La Habra and Montebello: 65 cents a barrel.

Torrance: 14 to 21.9 gravity 65 cents with differential of one cent for each degree to 25 gravity and two-cent differential for 25 gravity. Top price, 25 gravity, 70 cents.

Richfield: 14 to 20.9 gravity 65 cents; 21 gravity 66 cents with differential of two cents for each degree upward. Top price, 25 gravity, 74 cents.

Elwood: 33 gravity 79 cents; 34 gravity 81 cents with differential of three cents for each degree upward. Top price, 36 gravity, 87 cents.

Newhall, McKittrick and Kern River: 55 cents a barrel.

Midway-Sunset, Elk Hills and Buena Vista Hills: 14 to 21.9 gravity 55 cents; 22 gravity 56 cents; 23 gravity 58 cents; 24 gravity 61 cents; 25 gravity 64 cents; 26 gravity 66 cents; 27 gravity 68 cents; 28 gravity 71 cents; 29 gravity 74 cents; 30 gravity 76 cents.

Lost Hills: 14 to 20.9 gravity 55 cents; 21 gravity 57 cents; 22 gravity 59 cents; 23 gravity 60 cents; 24 gravity 62 cents; 25 gravity 64 cents; 26 gravity 66 cents; 27 gravity 67 cents; 28 gravity 69 cents; 29 gravity 71 cents; 30 gravity 72 cents.

Coalinga: 14 to 24.9 gravity 55 cents; 25 gravity 57 cents.

Wheeler Ridge: 55 cents a barrel.

Athens, Dominguez and Rosecrans: 24 to 24.9 gravity 69 cents with differential of two cents for each degree upward. Top price, 34 gravity, 89 cents a barrel.

Oklahoma, Kansas, North Texas (Effective April 1, 1932)

Below 29 gravity; 76 cents, with differential of 2 cents for each degree to 40 gravity and above which is posted at $1.00.

Texas Panhandle: (Effective April 1, 1932)

Gray County: Below 35 gravity: 71 cents, with differential of 2 cents for each degree to 40 gravity and above which is posted at 88 cents.

Carson and Hutchinson Counties: Below 35 gravity; 66 cents with differential of 2 cents for each degree to 40 gravity and above which is posted at 78 cents.

West Texas: (Effective April 1, 1932).

Crane-Upton, Crockett, Ector, Howard-Glasscock, Pecos and Winkler Counties, Texas, and Lea County, New Mexico: 65 cents a barrel.

Southwest Texas: (Effective April 11, 1932)

Refugio: Heavy 80 cents.

Refugio: Light: (Same as Gulf Coast—see below).

Gulf Coast: (Effective April 1, 1932).

Goose Creek, Hull, Liberty, Orange, Pierce Junction, Mykawa, Moss Bluff, Raccoon Bend, Barbers Hill, Sour Lake, Spindletop, Sugarland, West Columbia, Humble and Refugio Light: Below 25 gravity: 80 cents, with differential of 1 cent for each degree to 40 and above which is posted at $1.00.

Mirando: 80 cents; **Salt Flat:** 75 cents; **Darst Creek:** 75 cents; **Pettus:** $1.00; **Markham:** Same as Gulf Coast.

East Texas (Effective April 1, 1932)

Flat Price: 98 cents.

North Louisiana and Arkansas: (Effective April 1, 1932)

Caddo, Homer, Haynesville, Bull Bayou, Sabine, Cricton, De-Soto, El Dorado, Cotton Valley, Sarepta, Cartersville: Below 25 gravity 68 cents with differential of 2 cents for each degree beginning with 25 gravity and ending with 40 and above. Top price $1.00 a barrel.

Smackover: 65 cents.

Rocky Mountain States: (Effective April 11, 1932).

Salt Creek: Below 29 gravity 76 cents; 29-29.9 gravity 78 cents, with differential of 2 cents each degree to 40 and above. Top price $1.00.

Elk Basin and Grass Creek: $1.20; **Big Muddy:** 98 cents; **Lance Creek,** $1.15; **Rock Creek:** $1.00; **Sunburst:** $1.05; **Osage:** 98 cents; **Cat Creek:** $1.20; **Pondera:** 90 cents; **Hogback, New Mexico:** 80 cents.

Mid-Western States: (Effective April 11, 1932).

Lima: $1.15; **Indiana:** 75 cents; **Illinois:** $1.10; **Princeton:** $1.10; **Wooster:** $1.25; **Western Kentucky:** $1.05.

Pennsylvania: (Effective April 25, 1932).

Bradford District: $2.02; **National Transit Oil:** $2.02; **Southwest Pennsylvania Pipe Line Oil:** $1.75; **Eureka Pipe Line Oil:** $1.70; **Buckeye Pipe Line Oil:** $1.55; **Corning Crude:** $1.05.

Michigan: (Effective May 17, 1932), **Midland:** 65 cents a barrel. **Muskegon:** 76 cents to $1.00 a barrel.

Canada: (Effective Nov. 3, 1931).

Petrolia: $1.90; **Oil Springs.** $1.97.

Why Measure

Bottom Hole Pressures?

MID-YEAR MEETING
TULSA, JUNE 1, 2, 3, 1932

A PAPER by H. D. Wilde, Jr., Humble Oil & Refining Company, Houston, presented as a feature of the mid-year meeting of the A. P. I. production division at Tulsa June 3, and entitled "Why Measure Bottom Hole Pressures?" constitutes an illuminating answer to the question involved in that title.

Although the measurement of bottom hole pressures is a relatively recent development, much money and effort are being spent now in such pressure determination work, particularly in Texas and New Mexico, it was stated.

Only a few scattered determinations had been made, either by direct or indirect methods, until a few years ago, it was brought out; but since then various systematic pressure surveys have been undertaken, the investigations spreading to numerous Texas and New Mexico fields, and interest in the subject increasing with development of satisfactory methods for determining the bottom hole pressures with precision.

H. D. WILDE, JR.

The subject is so new, nevertheless, that many people in the oil industry wonder why it should be necessary to go to the trouble and expense of measuring the pressure at the bottom of a well when the pressures at the casing head or tubing head are so readily available, and furthermore, what practical use can be made of the bottom hole pressures after they are determined. It is the answering of these questions which the author makes his primary objective in the paper.

Shortcomings of Surface Presures

Surface pressures are but rough indications of the bottom hole pressure, since no dependable simple relation has been developed between pressure measured at the surface and that existing at the bottom of the well.

The relations between surface and bottom hole pressures are discussed as found under varying conditions. In shut-in wells, for instance, gas having risen to the top, and oil remaining below, it is possible to calculate bottom pressure by gaging surface pressure and adding pressure due to weight of the gas column plus that due to weight of the column of liquid, but such calculation requires knowledge of average density of the liquid as well as of the exact position of the level dividing liquid and gas. Determination of that level is as difficult as the more direct process of running a pressure instrument.

Producing through tubing with a gas-oil ratio high enough for much free gas to accompany the oil to the well, a well theoretically should have fluid level in the casing about even with bottom of the tubing, and casing head pressure corrected for weight of gas column in the casing should show bottom hole pressure. Practice has demonstrated that this is true usually but not always, the fluid level being maintained higher than the bottom of the tubing despite high gas-oil ratios. Illustrating errors found in calculations of this type, the author of the paper presented a table comparing measured and calculated bottom hole pressures in the Hobbs field in half a dozen wells all producing at several different rates, the calculated pressures being almost invariably lower than actual observed pressures, and the error ranging from a few pounds to more than 700 pounds.

In fields with bottom hole pressure great enough to raise the fluid level to the surface it is possible to shut a well in, bleed off gas which rises to the surface, leaving a solid oil column to the surface. Measured well head pressure plus pressure due to weight of the column of oil would then indicate bottom hole pressure; but the latter factor necessitates knowing average density of the fluid, and such knowledge must be based on actual observed pressures as shown by pressure measuring instruments employed in the field. Even then some error occurs due to density varying from well to well, such error in the East Texas field for instance, amounting to 10 to 50 pounds.

In wells which are flowing the relation between surface and bottom pressures is even more complicated, the pressure at the top of the flow string depending not only on pressure at the bottom but also on friction of the oil and gas flowing up the string, depth of the well, gas-oil ratio, solubility of gas in the oil, and slippage of gas past the oil. These factors are difficult to evaluate, particularly the friction and slippage factors, and consequently well head pressures are poor indicators of bottom hole pressures in flowing wells.

Instruments for Measuring Bottom Hole Pressures

Bottom hole pressures may be measured either with the well shut in or with it producing oil, the pressures of the two types being valuable for separate purposes.

Measuring devices are of three general types, as follows.

(1) Recording gages which are lowered on a single-strand wire line to the bottom of the well constitute one group. In this type the gage must be brought to the surface each time the chart is to be removed and readings observed. The pressure-sensitive element may be either a Bourdon tube (a tube with a closed end wound into a helical coil) or a piston sliding through a pressure-tight packing gland and compressing or extending a helically coiled spring. (2) In the second type of gage, the pressure-sensitive element is connected to an electrical system by means of which the pressures can be read continuously at the surface. (3) In the third type of gage compressed gas is introduced into a string of tubing extending nearly to the bottom of the well, the gas forcing all liquid out of the tubing, and the pressure required for doing so against the bottom hole pressure showing the value of the latter when correction is made for weight of the column of gas in the tubing.

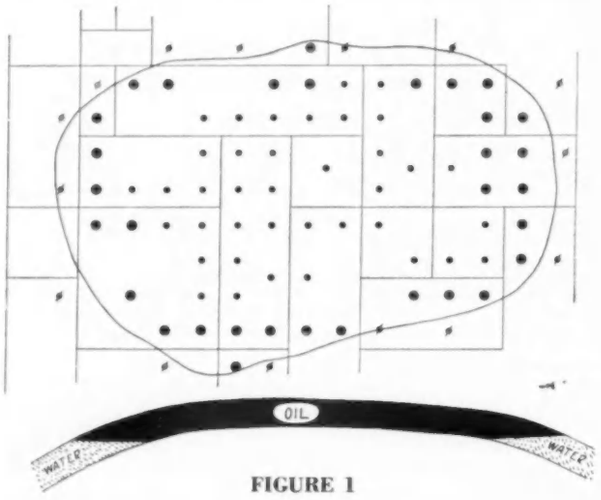


FIGURE 1

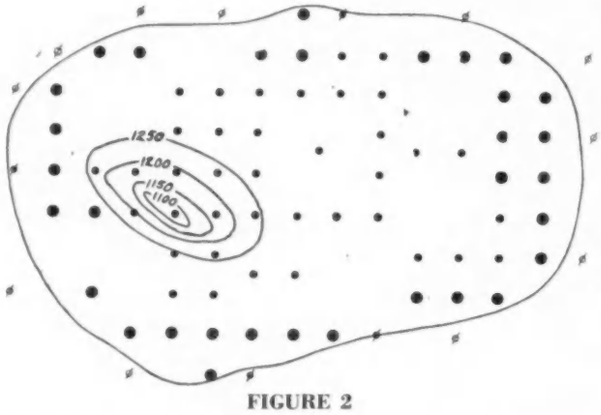


FIGURE 2

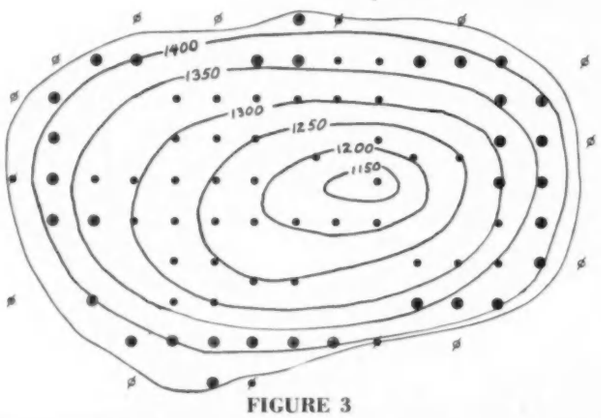


FIGURE 3

Since wells vary in depth and are differently equipped, bottom hole pressures are commonly taken at different levels, and comparison of pressures in different wells requires that they be taken at or corrected to a common level, such correction being made by adding or subtracting pressure due to a column of oil as high as the vertical distance between the point where the reading is taken and the common or datum plane.

Practical Uses of Bottom Hole Pressures

A primary application of bottom hole pressures is in connection with determining reservoir pressure in a field. The average pressure is not energy itself, it is pointed out, but is a manifestation of the energy in the reservoir. By keeping record of decline of such reservoir pressure, the rate at which available energy is consumed can be observed and the engineer can predict when the field will quit flowing, and also how much oil the field will ultimately produce.

Another practical use for bottom hole pressures is in ascertaining potential production of wells, the data being substituted for open-flow tests. The Yates field, West Texas, was cited as the scene of such application.

By measuring pressures in a shut-in well at different depths, location of fluid level can be established. The method of carrying out this application of the pressure data is explained in the paper.

Another important use for pressure information is in determining productivity of the formation from which a well is producing. The difference between flowing pressure and shut-in pressure of a well is proportional to rate of its flow, and therefore the barrels per day produced for each pound of pressure drop is a measure of the average permeability and thickness of that part of the reservoir surrounding the well. With tests scattered throughout a field a map may be prepared showing variation of productivity over the field. It will indicate tight areas or highly productive areas, and is very helpful toward intelligent operation of the field.

Pressures measured at different depths in flow strings of flowing wells help in understanding the oil and gas flow, and by that means relationship between slippage and factors affecting it may be established.

Still another use—and a highly important one—for bottom hole pressures is in ascertaining and watching sub-surface conditions which are developing in an oil field during course of its production. In this connection a common practice is to draw contour maps for the field comparing bottom hole pressures, the pressure at datum level in each well being marked on the map, and lines connecting points of equal pressure being drawn.

Contour Maps

The author of the paper illustrates interpretation of contour maps with five drawings, each assuming different pressure data for a given hypothetical field. In the field well locations and the single producing sand are as shown in Figure 1. The contour line shows productive limit, and encircled wells yield water, indicating presence of water around the edge, although it is not known whether the water furnishes drive or is being produced with energy from within the reservoir. No free gas was originally present, and original pressure at 3500 feet below sea level was 1500 pounds. After yielding 10 per cent of its ultimate recoverable oil under restricted flow, a shut-in pres-

sure survey is made. Various cases are assumed, and interpretation of each contour pattern is discussed.

In Case 1, illustrated by Figure 1, all wells show same shut-in pressure of 1300 pounds at the datum level, indicating that water-drive is absent or else very feeble; for otherwise pressures would be higher where water is entering. Each well is drawing expulsive energy for producing oil from within its own natural drainage radius, and oil or energy are not moving in general from one to another part of the field. This case is described as rare; for if all wells have been producing at the same daily rate, it means that producing sand is remarkably uniform in thickness, porosity, and permeability over the field; while if the wells have been producing at different rates, the rates have been nicely adjusted to compensate for differences in sand thickness and permeability.

In Case 2, illustrated by Figure 2, similar conditions exist, but in the western part of the field is an area of lower pressure. Feeble or absent water-drive is indicated, and the noted low pressures are due either to unduly heavy withdrawal of oil or to low sand permeability in the area. Relative permeability in the low-pressure area may then be determined from differences in shut-in and flowing pressures at various rates of flow; and if the tests do not indicate low permeability, heavy withdrawals must have been made.

In Case 3, shown in Figure 3, pressure around the edge is uniformly higher than in the main body of the field, and it gradually declines toward the center. Lowest pressure is east of the center. Approximately equal withdrawals from all wells have been made. The pattern shows that water-drive is furnishing considerable of the energy which lifts the oil and is thus quite powerful. Pressure around the edge being uniformly high, water is coming in evenly from all sides. The low-pressure area east of the center indicates the eastern part of the field is less permeable than the western.

In Case 4, contour pattern being as shown in Figure 4, pressures are highest at the southeast corner, and they decline steadily across the field to the northwest, showing presence of water-drive, but that water has access to the field only near the southeast corner. As contours bulge toward the northwest, an open permeable streak diagonally across the field is indicated.

In Case 5, indicated by Figure 5, pressures at the edge are low and increase toward the center. Before reaching the center they stop increasing and start decreasing. This hypothetical field differs from the preceding, since most wells show a thin shale section dividing the producing sand into an upper and a lower sand, although its presence is questionable in many wells, particularly near the center of the field. It is not clear whether the shale is continuous over the field and prevents communication between the two sands or whether the sands are sufficiently connected to form a single reservoir. Wells near the center have been drilled almost to the bottom of the sand. Several have been drilled into the impervious rock below the sand without encountering water, indicating that water is unable to come into the center of the field from below. To avoid water trouble, wells near the edge have been drilled only short distance into the sand, hardly any reaching the shale layer lying between upper and lower sand. Most wells between the edge zone and the center penetrate into the lower sand. It might appear here that water drive is absent, because edge pressures are lowest. Yet decreasing pressure gradients away from the intermediate zone towards the edge and the center indicate drive toward edge and center. The shale layer apparently forms a rather effective barrier between upper and lower sands, except near the center of the field. The upper sand is a lens that pinches out beyond limits of the field, and is not connected to a source of water that can create water-drive. On the other hand, the lower sand is under water-drive from the edge toward the center. If edge wells were drilled into the lower sand they would show high pressures, but actually they show the low pressure in the upper sand. The direction of the drive is therefore from the edge toward the center in the lower sand, and from the center toward the edge in the upper, as shown by the arrows in the section below the map. This situation is revealed only by the measurement of bottom hole pressures.

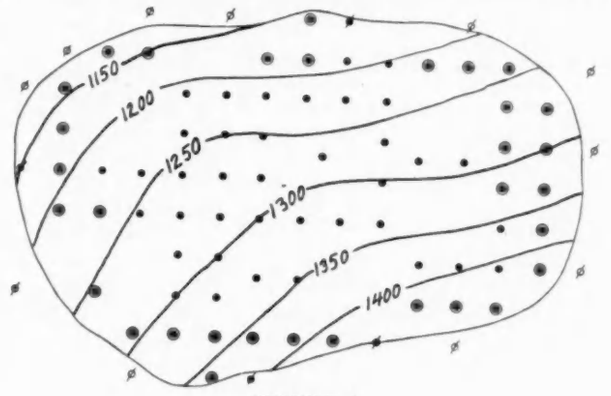


FIGURE 4

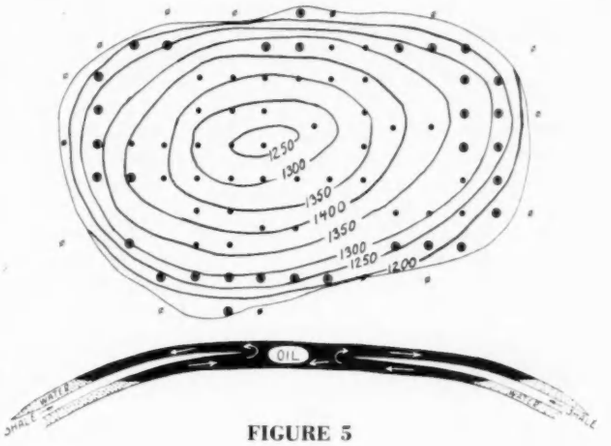


FIGURE 5

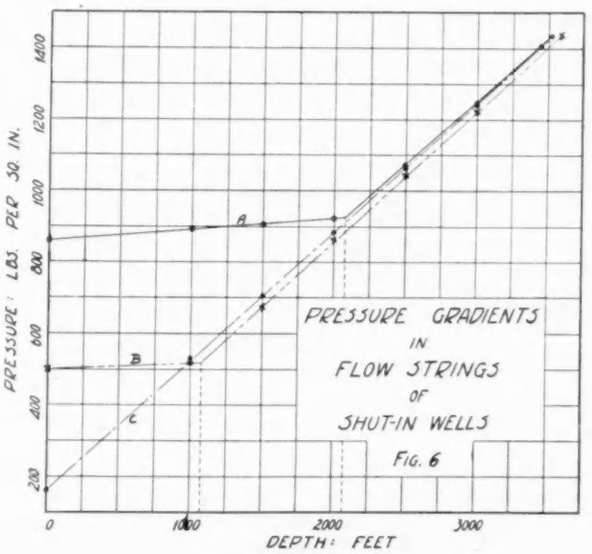


FIGURE 6

Geology *and the*

AT the twelfth annual meeting of the American Petroleum Institute, at Chicago, in November, 1931, three addresses of far-reaching importance were delivered on the subject of the "New Conception of Oil Production." I refer to the papers by J. Edgar Pew, John R. Suman, and W. P. Z. German (Proceedings 12th Annual Meeting, Am. Petr. Inst., Section IV. Production Bull. 208, pp. 7-24. Dec. 1931). The basic principle in this "new conception" is two-fold: (1) that each owner of minerals beneath the area underlain by a pool of oil and gas is entitled to his share, but to no more than his share, of the oil and gas in the pool in proportion to the quantity of recoverable oil and gas originally in that part of the pool below the surface property under which he owns mineral rights; and (2) that he is entitled to have the pool operated in a practical and efficient manner to yield a maximum ultimate recovery of the oil and gas. The second condition is obviously a corollary of the first since owners of the minerals, who by definition may be termed owners of the pool, cannot all obtain their just shares if the pool is not drilled and managed in the interests of mutual economy and efficiency. If any one operator handles his development program without due regard for the rights of his neighbors, others in the pool will suffer losses. It is clear, also, that the second condition implies proper use of gas as energy before it may be utilized as fuel.

In the present paper I am not going to attempt to set up a picture of how an oil pool might be developed to secure the maximum recovery, fairly distributed to owners of minerals. Many plans have been submitted and several are being tested. What I shall try to do is to outline those subsurface conditions, those geological conditions of which an understanding is fundamental to any plan of orderly pool development.

MID-YEAR MEETING

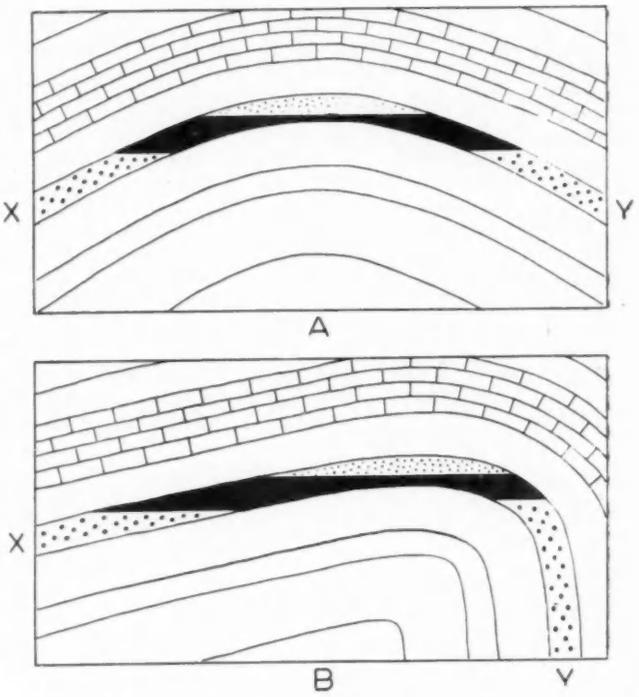
TULSA, JUNE 1, 2, 3, 1932

AN oil pool is strictly and wholly a geological phenomenon. It occurs within some kind of porous reservoir rock. It is definitely associated with some type of geological structure, which, in most cases, comprises strata inclined from the horizontal. It exists because, in its relations to this structure, the upward and lateral escape of the petroleum is prevented by impervious rocks which seal the reservoir. Within the reservoir the oil is commonly associated with gas and water. Gas occurs dissolved in the oil and if, under the conditions, there is an excess of gas, it may occur in a free state. These three fluids, water, oil, and free gas, are distributed in the reservoir in the order of their specific gravities, the gas above or updip from the oil, and the water below or downdip from the oil. They are under the influence of certain forces of compression, due chiefly to the weight of the column of rock overlying the pool and to hydrostatic pressure within the reservoir rock, operating from some distant region. These several conditions which pertain to the oil pool, namely, the geologic structure and the reservoir rock, the oil, gas, and water, and the pressures acting on these fluids within the reservoir, may be classified as rock factors, fluid factors, and energy factors, all of which are of primary importance. Together they constitute the geological framework of the oil pool.

In any plan for orderly development it is essential that consideration be given to the kind of geologic structure involved. A majority of the known producing structures fall under one or another of these four classes: (1) domes and closed anticlines; (2) fault structures; (3) lensing reservoir rocks; and (4) unconformities. In Figure 1 is a dome in cross section. It may be symmetrical like A, or asymmetrical, like B. The arch may be relatively high or low. The main point is that any vertical cross section through the top will show the beds bent in an arch. Assuming that the reservoir rock XY, is uniformly porous throughout, oil, free gas, and water will be distributed in this type of structure as indicated.

Figure 2 illustrates cross sections of fault structures. Oil, gas, and water are represented in their usual relations. In A retention of petroleum is accomplished by downward bending (drag) and sealing of the reservoir rock at the fault. In B, accumulation of oil and gas depends wholly on sealing of the reservoir bed at the fault, since the *structural* relations are such as to facilitate escape up the fault plane. Flank accumulations against salt domes are in many cases a special phase of B.

FIGURE 1



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New Conception *in Field Development*

FREDERIC H. LAHEE
Chief Geologist, Sun Oil Company, Dallas, Texas

Figure 3 shows three samples of lensing reservoir rocks. In A, the reservoir pinches out updip in a series of tilted beds. In B, pay sands pinch out on an anticline, but some distance below the crest. In C, the reservoir rock passes over the top of an anticline and pinches out downdip, but at a level higher than the water-oil contact on the structure.

In Figure 4 are several conditions which may be encountered in association with unconformities. Bear in mind that an unconformity is simply an old erosion surface, like our present land surface, covered up and deeply buried by a later series of deposits. In Figure 4A, a porous reservoir bed is unconformably overlain by an impervious layer in the lower part of the younger rock series. In B, the reservoir rock is in the younger series. Its updip edge is sealed where it abuts against the uneven surface at the top of the older series. In Figure 4C more complicated relations are shown. Bed X is capped by an impervious layer on each side of the anticline. Bed Y is similarly capped on the right, but on the left it is in contact with porous basement sand in the overlying series, thus permitting escape of oil and gas into this basement sand. For purposes of demonstration we may suppose that closure both above and below the plane of the sketch has allowed accumulation in bed Y on the right.[1]

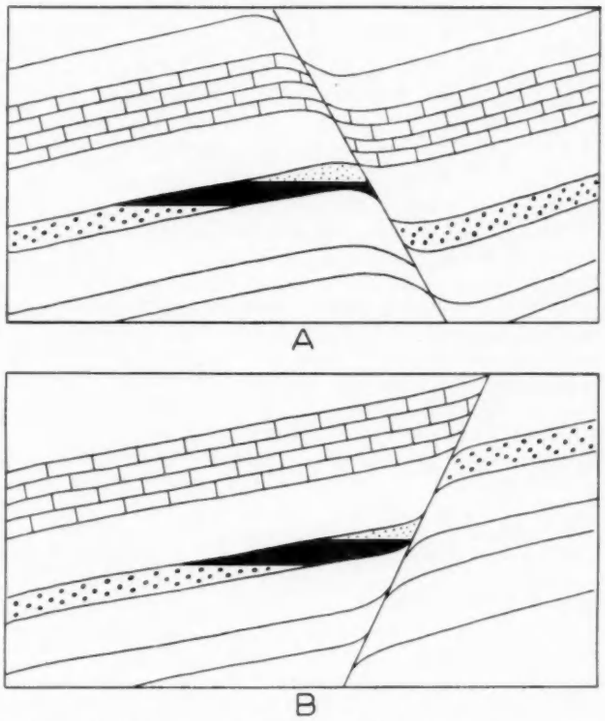
In the four figures outlining geologic structures, we have assumed that the reservoir rock is uniformly porous; but this is almost never true of pay beds in actual experience. In the first place the reservoir may be a true sand, composed of granular particles of quartz and other hard minerals, or it may be a limestone or a dolomite. Rarely it is some other kind of rock. Within a sandstone or a limestone or dolomitic reservoir the pore spaces may differ in size, in distribution within the rock, and in continuity. We need not go into the causes of these differences. The significant facts to bear in mind are that such variations in porosity are common and that they have a very definite bearing (1) on the distribution of oil and gas on a structure and (2) on the permeability of the reservoir rock.

[1]In using any of these diagrams one should remember that they represent only one section across the structure. Vertical sections taken in other directions might reveal somewhat different relations.

Permeability, in this connection, refers to the ability of the rock to yield the fluids within its pores. There is a most important distinction between porosity and permeability. A fine sand composed of small grains of equal size and a coarse sand composed of large grains of equal size may both have the same porosity, or total pore space, but the permeability of the coarse sand may be many times that of the fine, due to the freer movement of fluids through the larger open spaces. Permeability is sometimes called "effective porosity." The efficiency of the energy available within the reservoir is largely dependent on the permeability of the pay rock.

Geology is complex. Most wildcat wells are located on very slim chances: the chance that the geological indications on the surface are reliable; the chance that these indications reflect deep structural conditions; the chance that proper reservoir conditions are present within drillable depths; the chance that oil is contained in such reservoir rocks; and the chance that the well is favorably placed to tap any such oil accumulation. We must not forget that during the last 15 years the more conspicuous and easily

FIGURE 2



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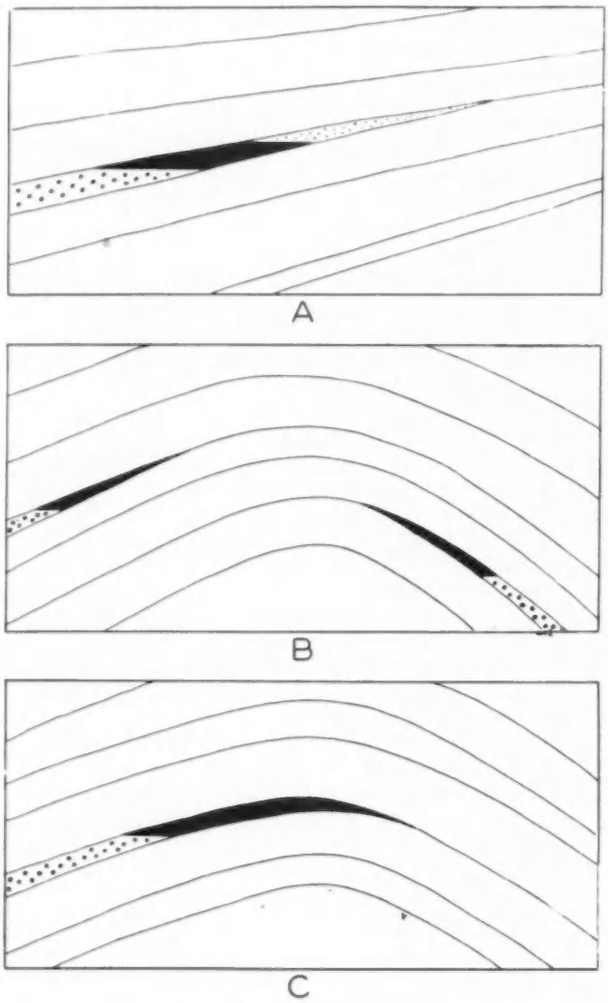

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recognized surface structures have been discovered. Those not yet reported are either in regions thought to be unfavorable for petroleum or are so faint and difficult of interpretation or of access as to have escaped attention hitherto. Furthermore, we are drilling to greater and greater depths with less and less probability of close coincidence between surface and subsurface structure. These are two factors which have progressively augmented the risk in petroleum exploration. To offset them we have evolved and improved methods of subsurface study, notably through geophysical investigations, core drilling, and correlation of strata by characteristics of their mineral grains and their inclosed microscopic animal and plant remains. Micropaleontology, which has to do with these minute organic remains, has become of very great practical importance in the last few years. The trend of geology in its application to the search for oil has ever been toward enhancing the value attached to subsurface research, particularly through the study of the cuttings and cores taken from wells.

Before an oil pool is discovered by drilling, there is no movement of fluids within it, nor is there any transfer of energy. The whole system, involving rock factors, fluid factors, and energy factors, is in stable equilibrium. The pool bears a fixed relation to property boundaries on the surface, but, just like the rock factors of deeply buried geologic structure and stratigraphy, this relation cannot in any way be determined prior to drilling. It can be roughly estimated and predicted, but not established.

If a pool were to be developed under the most ideal conditions of single ownership, single management, and efficient technical program, a sufficient number of wells, properly spaced, would be drilled to ascertain the unknown factors pertaining to the form, size, and position of the pool, but none of these wells would be allowed to produce until this information had been acquired and utilized in constructing a rational plan of procedure. Ordinarily, however, ideal scientific development is impossible because of the diversity of ownership of vested rights to the surface and minerals. Quite frequently, as we all know, several or even many wells are completed and placed on production in a newly discovered pool before a scheme of orderly development can be devised and put into effect.

If a petroleum reservoir is tapped by drilling, and if oil, or gas, or water is withdrawn, the original stable equilibrium of the pool is destroyed and the oil and gas and energy within the reservoir begin to suffer change in their relations to one another, to the reservoir, and to the surface property lines. And the disturbance of the original fluid and energy relations will be greater and more uneven in proportion as the drilling and producing are irregularly distributed in point of well spacing and rate of yield. Local close spacing and rapid rate of production may promote early invasion of edge water or of bottom water with consequent losses in oil; or they may cause uneconomic gas-oil ratios or actual wastage of gas, with consequent losses in reservoir energy, which again, in the final analysis, are losses in oil. These facts are too well recognized to require further elaboration here.

Now we are brought face to face with an apparent dilemma. The new conception calls for an equitable share of oil and gas to each owner of the pool. To learn what this equitable share is we must develop the pool by drilling, but in developing the pool, except in the case of the ideal plan above cited, we inevitably alter the original fluid and energy relations on which equitable participation must be founded. The conclusions to be drawn from this fact and from the necessity, already discussed, for subsurface geological information, are, first, that development of any pool must be conducted as nearly in accordance with the ideal scheme as possible, and second, that from the very beginning of drilling operations every effort must be made to assemble pertinent subsurface data.

Some of these data, relating to such properties as porosity, size of grain, fossil content, and the like, can be obtained at any time from examination of core samples, *but* the cores must be secured during the drilling. Careful records should be made of top-of-pay-sand elevations and amount of penetration of pay sand. Most important is the measurement and collection of data on gas-oil ratios, fluid levels, and bottom-hole pressures. The interpretation of these factors is valuable in efficient pool operation, not only at long intervals of time but from day to day as

drilling progresses. Since they are subject to change their observation should be continued regularly and frequently during the life of the field.

The study of bottom-hole pressures is rather a new departure in oil-production methods. They record conditions at the face of the pay sand, at the bottom of the well, and so eliminate various factors impossible of accurate determination when pressures are measured at the casing-head. Shut-in or static bottom-hole pressures, are commonly taken when a well has been closed in for 24 hours, and flowing or differential pressures are taken while the well is producing. Static pressures, when compared from well to well, show whether oil withdrawals have been unequal, and perhaps locally excessive, in different parts of the field. Thus, they serve as a guide for properly utilizing reservoir energy and for equalizing and retarding water encroachment.

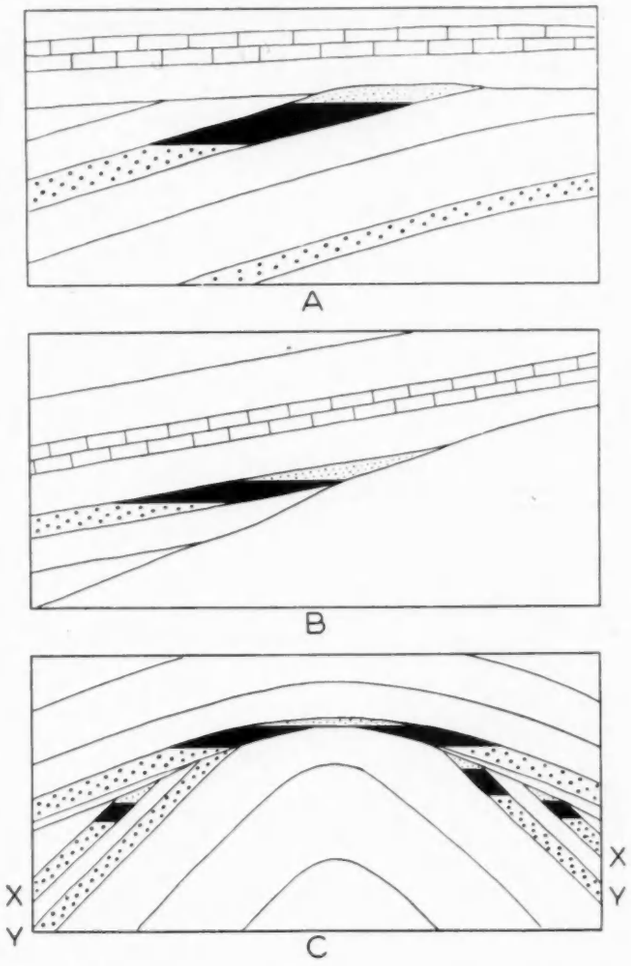
Flowing bottom-hole pressures are an index of the permeability of the pay sand. All previous methods of estimating yield have been based either on decline curves of full capacity daily production, or on porosity or permeability determinations made on small samples taken from the reservoir rock in individual wells. That such samples are representative of the vast extent of the rock outside of the cross section of the hole is purely a guess. But in bottom-hole pressures we have a fair measure of the ability of the rock to yield its oil to the well. With a pressure-recording instrument, lowered to the bottom of the hole, readings may be made with the well shut in and with it flowing. If the pay sand is tight, yielding its oil slowly, there will be a relatively large drop in the pressure value of the flowing well, but if the sand is open, that is, highly permeable, the drop from the shut-in pressure value to the pressure value when the well is permitted to flow will be much less. In functioning as a measure of relative permeability, these pressure records provide means of correlating and analyzing pay formations, estimating potential production of wells, planning for economical spacing of wells, appraising producing properties, and so on. There can be no question that the utilization of bottom-hole pressure measurements marks a real step forward in producing technique.

Information of the kind which we have been discussing must be recorded at the proper time, for otherwise it may be lost forever. Too often operators, not appreciating the ultimate value of such information, are loath to incur the relatively slight additional expense involved in its collection. And too often time has been lost in futile arguments where an understanding of this need would have simplified achievement of a program of operation.

In conclusion, and by way of summary, I would suggest that the theory and practice of orderly development of oil and gas pools include three conceptions. Granting what most of us are no doubt willing to concede, that an oil accumulation is something definitely bounded and with certain properties which affect the whole pool, we must admit that scientific operation of the pool as a single unit will be technically most sound. This first conception has been proclaimed for several years, and although it may not always be possible of attainment, it is a goal toward which we should strive in cooperative management in planning any kind of systematic development.

Second, we have the "new conception" which calls for equitable participation in the oil and gas, and equitable and economic management of operations, for all those who are entitled thereto within the boundaries of the pool, a policy which is a great advance over the methods of legalized piracy which have too long prevailed.

FIGURE 4



In Figure 4 are several conditions which may be encountered in association with unconformities. In Figure 4A, a porous reservoir bed is unconformably overlain by an impervious layer in the lower part of the younger rock series. In B, the reservoir rock is in the younger series. Its updip edge is sealed where it abuts against the uneven surface at the top of the older series. In Figure 4C more complicated relations are shown. Bed X is capped by an impervious layer on each side of the anticline. Bed Y is similarly capped on the right, but on the left it is in contact with porous basement sand in the overlying series, thus permitting escape of oil and gas into this basement sand. For purposes of demonstration we may suppose that closure both above and below the plane of the sketch has allowed accumulation in bed Y on the right.

As the third conception, I want to emphasize the importance of clearly recognizing that every pool includes and is surrounded by a complex system of geological conditions, which cannot be known before drilling, but which must be analyzed before equitable participation, according to the "new conception," is possible. The accumulation and study of the geological facts which are to serve as the basis for efficient pool operation and as the basis for equitable participation in oil and gas, must go on with the drilling of the pool. I believe that an intelligent appreciation of this "geological conception," if I may so call it, will be salutary to the cause of orderly pool development.

Effect of Ratable *Production On Ultimate* Recovery

E. V. FORAN
Consulting Engineer, Ft. Worth, Texas

E. V. FORAN

THE amount of ultimate recovery obtainable from any sub-surface petroleum reserve depends largely upon the following natural factors: It's saturation of oil and gas, porosity, permeability, pressure and position of water with respect to the producing horizon. Two of these five natural factors, porosity and permeability, undergo no appreciable change during the life of the pool and are not subject to control, while the other three, saturation, pressure and water status, are subject to change and are controllable within certain limits. All of these natural factors in any common pool bear inseparable relationship to each other.

In addition to these natural factors affecting ultimate recovery, several human elements enter into the situation in accordance with the development and operation of the pools in such a manner as to utilize with varying effectiveness, the natural factors mentioned above. They are: Method of well completions, choice of equipment, spacing, rate of development and the rate and distribution of drainage. The rate and distribution of drainage are the most vital of the human elements involved since they are factors to be dealt with throughout the life of the pool and during which time they control to a marked degree the effect of the natural formation factors on ultimate recovery. Obviously, it is possible to administer to a pool, methods of operations which may apply a rate of production and distribution of drainage which may be very suitable to the natural conditions within the pool or that may be highly unsuitable to these conditions. The methods referred to above may be classified as unrestricted, competitive development and production, or cooperative development and production.

Pools in which development and producing operations are carried on in an equitable and orderly manner are referred to as being operated in accordance with the principles of ratable production.

A brief study of the different major pools of the Mid-Continent area will show at once that the manner in which the details of ratable production is administered to individual pools varies considerably, but the underlying principles of this method of practice are embodied in all of them. A history of Mid-Continent development and practice since 1920, reveals many examples of the application of both orders of operations—restricted development and practice, and, unrestricted development and practice. Examples of the unrestricted development and production practice would include the following pools: Burkburnett, Smackover, Borger, and the early development and practice of Seminole, Winkler and East Texas Pools. Examples of restricted, orderly development and ratable production would include such pools as Yates, Van, Sugarland and Raccoon Bend.

MID-YEAR MEETING
TULSA, JUNE 1, 2, 3, 1932

Unrestricted Production and Ultimate Recovery

The beneficiaries of unrestricted production in every pool are generally in the minority, and their sole objective is high initial production and profits without regard to what the ultimate results of the pool as a whole may be. The final outcome of any procedure based on this viewpoint will be entirely dependent upon the law of chance, since the important factors, water encroachment, reservoir pressure or energy conservation, and the interrelationship of all other sub-surface factors are totally disregarded, and are not subject to successful corrective measures after the development of the pool has progressed beyond a certain stage.

The Hendricks pool in Winkler County, Texas, is a practical example of unrestricted production in which the corrective factors were applied too late in the life of the pool to fully accomplish the desired results.

The Borger pool in the Texas Panhandle is another example in which unrestricted development and production was responsible for setting up a situation which developed beyond the point to which it could be corrected by the application of ratable production. However, during the early development of both Winkler and the Borger pools, ratable production was not universally recognized as a primary essential to high ultimate recovery, and therefore did not receive serious consideration. Moreover, the ownership in these pools was of a nature that immediately set up a highly competitive program of development, which greatly complicated what few efforts were made toward instituting a program of orderly development and production. In the Borger pool it was common practice to totally disregard the relationship of the gas to the water situation, and following the dissipation of several billion feet of gas in localized areas, the appearance of water in unexpected quantities presented, on short notice, new difficulties to operators for which the operators were not pre-

pared, and with the enevitable result that ultimate recoveries in those areas were much lower than would have been the case had orderly development and diligent cooperative efforts been applied during this stage of development.

The same situation occurred in the Hendricks pool in Winkler County, but to a somewhat lesser degree. At Hendricks, the pool was placed on a status of restricted production early in May, 1928, following a period of unrestricted production which developed difficulties that were never entirely overcome. Here too, as in the case of Borger, unreasonable waste and depletion of sub-surface gas was displaced by water in such quantities that the difficulties encountered could not be corrected, and the resultant loss in ultimate recovery of oil was realized too late for the application of the necessary corrective measures.

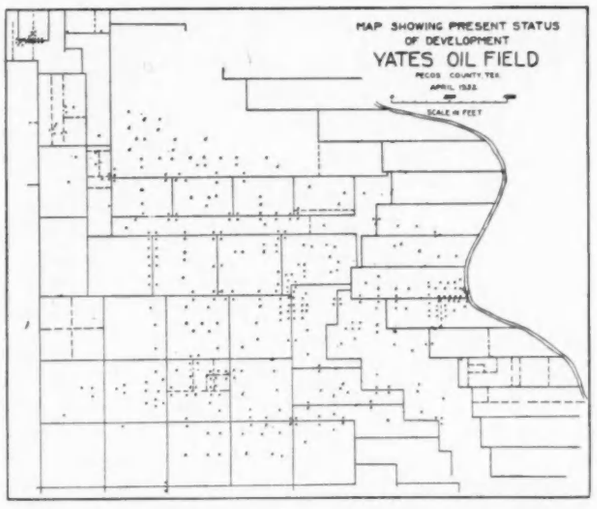
Both the Borger and Winkler pools serve as outstanding examples of the difficulties that may be encountered in the event new pools are discovered in areas of highly divided land ownership, and in which natural gas and water encroachment are primary factors of ultimate recovery.

Upon the discovery of new production, under these conditions, the first result is the setup of a system of competitive development and drainage, unless prompt steps are taken to institute cooperative measures instead. Generally any delay in the decisions regarding these matters, results in immediate complications which may partially defeat the best interests of the great majority of operators and royalty owners of the pool. It is obvious, from the history of competitively developed pools in the past, that equity has no voice or influence in matters of development or drainage. And any system which does not recognize an equitable program, immediately imposes on all operators an unrestricted drilling campaign, or, a loss in ultimate recovery on the leases of those who fail to keep pace with the development, as a result of unratable drainage. Unrestricted development of the pool unfortunately does not permit the necessary time to study the characteristics of the pool and still apply the advantages of whatever knowledge may be gained, while the pool is still in its early life. As a whole, little favorable can be said for this system of development, since it encourages and permits unethical practice, and the profits of unrestricted production are apparent rather than real, with respect to the pool as a whole, since the surplus recovery in the unrestricted areas is inevitably at the expense of correspondingly greater losses in the remaining partially drilled areas of the pool.

Restricted Production and Ultimate Recovery

In sharp contrast to those pools in which the evils of unrestricted development and production played a prominent part, there are in Texas a number of pools in which consistent restricted development and ratable production has prevailed since discovery of these pools. They are: Yates pool in West Texas, the Van pool in East Texas and the Sugarland and Raccoon Bend pools on the Gulf Coast. These pools may be said to represent in a general way the three major types of production in Texas. The Permian Basin lime production, the Central and East Texas sand production, and one type of the Gulf Coast production.

The Yates pool (Figure 1) was discovered in 1926, and gave promise of prolific production from this area in the West Texas Permian Basin lime. Unusually high reservoir pressures were encountered in this pool at shallow depths. The initial pressure being as high as approximately 740 pounds at 100 to 1200 feet. Due to the cavernous nature



of the lime, the ability of these wells to show a high potential production was outstanding. And, although the temptation to take advantage of this situation was equally as great as that in the case of Borger and Hendricks pools, nevertheless, good judgment was exercised and the operators in the Yates pool upon completing sufficient wells to indicate a major pool, immediately instituted the necessary procedure for some form of cooperation, and since they had little precedent to go by, it is natural to expect that some of the first opinions and measures would prove inadequate to meet the complications that were unforseen. As a result, cooperative measures in the form of restricted production were applied to this pool on October 1, 1927. The method of restricting production was based entirely upon the potential production of the wells, but soon proved inadequate to meet conditions since it still left the various operators with the privilege of unrestricted drilling if they chose to develop high potentials for the various leases. To eliminate this undesirable feature, the plan was revised in July, 1928, and took into consideration the acreage surrounding the producing wells as well as their potential ability to produce oil. This plan gave the advantage of spacing the inside wells on a tract in such a manner as to call for a minimum of development consistent with the highest ultimate recovery of oil. As a result, the wells on the higher part of the structure, which is the most prolific producing area, have been drilled to the extent of one well on 14 acres, whereas, in some of the outlying areas, spacing has been somewhat greater.

Due to the high permeability of the producing horizon in the Yates pool, the factor of water encroachment has received very careful study at the hands of the Yates Engineering Committee[1]. Due to the extremely high permeability of the lime, it is necessary that reservoir pressure be permitted to decline very slowly, and also uniformly, throughout the pool. There is known to exist on the top of the structure a higher ratio of free gas to oil than on the progressively lower portions of the structure, which, if allowed to escape in unreasonable quantities, will be displaced by corresponding encroachment of edge or bottom water. As a recent effort to further conserve the gas in the Yates pool as an agency for higher ultimate recovery, a great many of these wells have been tubed to reduce the quantity of gas which accompanies each barrel of oil, although the gas-oil ratios prior to the tubing installations of these wells was not unreasonably high compared to

[1] H. C. Hardison: Proration of Yates Pool, Pecos County, Texas. See Petroleum Development and Technology 1931, Transactions, A.I.M.M.E.

other Permian Basin pools, this feature is in remarkable contrast to the efforts made in the Hendricks pool under a somewhat similar situation. As a part of the constructive program which has been in force in the Yates pool during the past five years, the observation of botton hole pressures has assisted the operators in arriving at the best rates of flow from the pool as a whole since it is recognized that reservoir pressure is generally the most important function of a wells flowing status. Due to the fact that the Yates pool, to begin with, had no great excess of free gas, it is reasonably sound to believe that continual displacement of the withdrawn oil and gas contents by orderly water encroachment is responsible for the high order of pressure maintenance prevailing in this pool. Therefore, control of the close relationship between water displacement and restricted production taken ratably from all wells of the pool is the only manner in which full advantage of water as an agency of pressure maintenance can be realized. In the event that the same quantity of daily production should be taken unratably from the Yates pool, no doubt the water would still displace the withdrawn contents at the necessary rate to maintain the same mean reservoir pressure as that observed under ratable takings, but by no means the same uniformity of pressure in the different parts of the pool. When there is appreciable variation in pressure in different parts of the pool, there will likewise be appreciable differences of elevation of the water table within the pool. For this reason ratable taking from the pool is the only course open to the operators if orderly water displacement or encroachment is desired.

Rate of Gas Displacement

From a standpoint of water encroachment, the daily rate of gas displacement should be watched much more closely than the rate of oil production in those cases where large quantities of gas accompany the daily oil production from the pool. Examples of this may be cited in such pools as Borger, Winkler, Hobbs, Reagan County deep pool, Refugio and Oklahoma City. In certain portions of these pools, the gas accompanying the daily oil production, occupied in the reservoir many times the space occupied by the oil. Water, as a displacement agency, functions just the same whether the depleted withdrawn products of the pool be gas or oil. For example, in the Borger area, in 1926, gas-oil ratio from the oil producing strata of 2000 to 10,000 cubic feet per barrel were common. The reservoir pressure being in the neighborhood of 400 to 435 pounds per square inch, would indicate that each 1000 cubic feet of gas occupied the same space in the producing horizon as six barrels of oil. At 2000 cubic feet to 10,000 cubic feet per barrel ratios, the space occupied by the gas would vary, therefore, from 12 to 60 times that occupied by the oil. It is at once apparent that gas depletion under these operating conditions is the primary factor to consider in control of water encroachment, since more than 90 per cent of the water displacement under these conditions will result from gas depletion rather than oil depletion. This unusual condition existed in the early life of the Borger pool, largely as a result of the low initial reservoir pressures. Were the pressure in the Borger pool the same as that in other pools of equivalent depths, the displacement factor of the gas for the same gas-oil ratio would, of course, be very much lower.

In the Hobbs pool, New Mexico, where reservoir pressures of 1400 to 1500 pounds exist, each 1000 cubic feet of free gas occupies approximately the same space as about 1.7 barrels of oil. In the case of extremely high pressure pools, of which the Reagan County, Texas, deep pool is an example, 1000 cubic feet of free gas under pressures of between 3500 to 4000 pounds occupies only approximately the same space as 0.6 barrels of oil. In each of these three examples cited, the daily displacement of the withdrawn contents by water results primarily from gas displacement rather than from oil displacement, where the gas-oil ratios are abnormally high.

Examples of pools in which the prevailing gas-oil ratios do not play the most prominent part in the rate of water displacement are Yates, Van and East Texas. In these pools the average gas-oil ratios vary from approximately 200 to 500 cubic feet per barrel. A large percentage of this gas is in solution in the oil at the prevailing reservoir pressures and occupies a negligible space, as compared to that occupied by the accompanying oil. However, if in any of these pools, gas-oil ratios are abnormally high, then the displacement factor of the gas may approach or even surpass in importance that of the oil. It follows, then, that ratable production as applied in pools whose gas-oil ratios are inherently low that the daily rate of oil production from the pool is the primary factor to consider, and not the gas-oil ratio.

Van Field Development

The Van pool in East Texas is another example of a major pool whose development and producing history is similar in many respects to that of the Yates pool. The Van pool has an area of approximately 4100 acres and produces from the Woodbine formation. There are at present (May, 1932) 308 completed wells in the pool. The original reservoir pressure was between 1200 and 1300 pounds per square inch. The thickness of the producing horizon reached a maximum of approximately 650 feet at the highest point on the structure, that is to say the water table lies 650 feet below the highest portion of the producing horizon. Of this total section, approximately 50 per cent represents actual saturated and producing sand. The remainder being shale breaks and shale laminations. This pool, like Yates pool, instituted a program of restricted development and production from the very start. One of the first obstacles to this program was the development of a town-lot area, located within the pool in such a position as to threaten the success of any conservation measures. However, through purchase and other cooperative means, this densely drilled area of 25 wells was included in the general program of developing the pool, having, as a primary objective, a high ultimate recovery consistent with minimum development. This, of course, required the application of some form of ratable production, since both water hazard and gas conservation were recognized at the outset of development as controlling factors in accomplishing this objective. As a result, a plan recognizing both a well's potential and the acreage surrounding it as factors in arriving at the allowable for the entire pool and the distribution of the drainage within the pool was put into operation. After a period of more than two years of operation under this plan, the factor of acreage surrounding a well was modified by taking into consideration the reserves of oil underlying the acreage. When considering the fact that the thickness of the pay section of the acreage at the edge water is only a very small fraction of the thickness of the producing strata in those portions of the pool highest above the water table, it was obvious that some form of correction to the flat acreage allowable was necessary to maintain truly ratable production from this type of pool. In the Van pool the average gas-oil ratio is approximately 320 cubic feet per barrel (nearly all of this occurs in solution in the oil), and, therefore, the displacement factor of this pool depends almost entirely upon daily rate of production from the pool as a whole, and not so much upon the daily gas output. While gas-oil ratios within the pool vary somewhat, only

a very small percentage of the production is accompanied by a high gas-oil ratio.

The system of ratable production, as instituted in the Van pool, is not entirely applicable, as such, in some of the pools producing from cavernous limes, since it would be considerably more difficult to determine the relative amounts of oil in place under the different acreages in pools of this type. In carrying out the Van pool method of ratable production, it is not necessary to determine the absolute amounts of oil underlying the various acreages, since a knowledge of the relative amounts of oil under these acreages serves the same purpose. Determinations of reservoir pressures in the Van pool to date, have indicated that a very high order of pressure maintenance prevails, and should continue so long as ratable production is observed in the future in the same manner in which it has been in the past. In relative terms, the increased ultimate recovery from the Van pool will probably be as high as 50 per cent more than could be expected were the evils of unrestricted production allowed any place in the past three years of development and operation.

East Texas

The East Texas pool presents an example of early unrestricted development and production followed by an abrupt change to semi-restricted development and a method of ratable production different from that existing in any of the other major pools in Texas or the Mid-Continent. Owing to the great size of the pool and the highly divided ownership, the exercise of any measures of orderly development and production in the early life of the pool met with extreme difficulties and complications.

With the completion of the first 100 wells in the field, it was apparent that all of the gas in the reservoir occurred in solution in the oil. Reservoir shut-in pressures were obtained early in the life of the pool and proved to be more than 1600 pounds per square inch. During the period of unrestricted production (prior to August 17, 1931), rapid declines in reservoir pressures were observed in the densely drilled areas surrounding the three discovery wells of the south, central and north portions of the field. The resulting waste from the unrestricted production, even though the gas-oil ratios were extremely low, (approximately 300 cubic feet per barrel) required that drastic corrective measures be applied as soon as possible. Due to the extreme east portion of the field being somewhat remote from water, and also due in some cases to thinness of the pay section in this area, wells were subject to unreasonably high rates of pressure decline throughout the field and especially on the east side. The undrilled areas suffered an unreasonable decline in reservoir pressure due to having contributed a large portion of the energy necessary to maintain the persistent high rates of flow which continued from the wells in the densely drilled areas. The result of this practice is too well known for further discussion here. The corrective measures required were promptly applied on September 5, 1931, in the form of ratable production based on a uniform daily allowable production per well. It is true that this present method of ratable production from the East Texas pool is an immeasurable improvement over the former chaotic conditions existing during the period of unrestricted production, but nevertheless, it is still deficient in some of the important essentials of ratable production recognized in other pools. The rapid changes in development in this field up to the present time has rendered practically impossible, any system of ratable taking other than on the per well basis since potentials and acreage allotments called for complex administrative details unknown to other fields. The system of holding the field to a moderate total daily allowable production seems to be sound and reasonable until better methods are workable. The present daily rate of drainage from the pool would probably be conductive to higher ultimate recoveries if consideration were given to the recoverable reserves of acreage surrounding the wells in the more sparsely drilled areas or tracts. Observations of the bottom hole pressures in the sparsely drilled areas, indicated that, prior to the completion of wells in these areas, that an unreasonable decline in reservoir pressures, in many cases more than 200 pounds per square inch, has taken place. This is proof that oil in these areas was drained from considerable distances, whereas, it should be drained from wells completed in those immediate areas.

The greatest deficiency in the application of the present system of drainage lies in the fact that every location in the field must be drilled as soon as possible in order that drainage shall be effected in the most efficient manner. To correct this situation would require, as a first step, that the acreage surrounding the wells in the sparsley drilled areas be considered as lying within those wells' normal drainage areas; and that these wells be allowed to recover the oil from these areas in preference to more distant wells, which certainly can not drain as efficiently as the wells nearby to these areas. While a distribution of drainage proportionate to acreage is not a final solution to the problem of administering ratable production, it is beyond doubt, a necessary step toward the higher recognized forms of ratable production prevalent and proven in other pools.

Conclusions

1. Although the details of ratable production are not universally applicable to all pools, the underlying principles of the system can be applied to all wells and leases in a common pool.

2. The primary natural factors of high ultimate recovery from any pool, the maintenance of uniform reservoir pressure through gas conservation and control of water displacement, are inseparably related to restricted and ratable production.

3. The fact that gas-oil ratios are low give no assurance that high daily rates of flow from the pool or unratable production are permissible because the ability of water as a displacement agency to maintain the necessary uniform pressure in the pool is limited.

4. The highest ultimate recovery from any pool can only be accomplished through the earnest cooperation of every operator in the pool in eliminating wasteful practices that accompany unrestricted development and production. Any attempt at enlisting cooperation between operators and at the same time refusing to recognize equitably their interests within the pool is predestined to failure. Equity in an oil pool can not be protected except through some form of ratable production.

Recent Improvements in Oil Field Boiler Designs

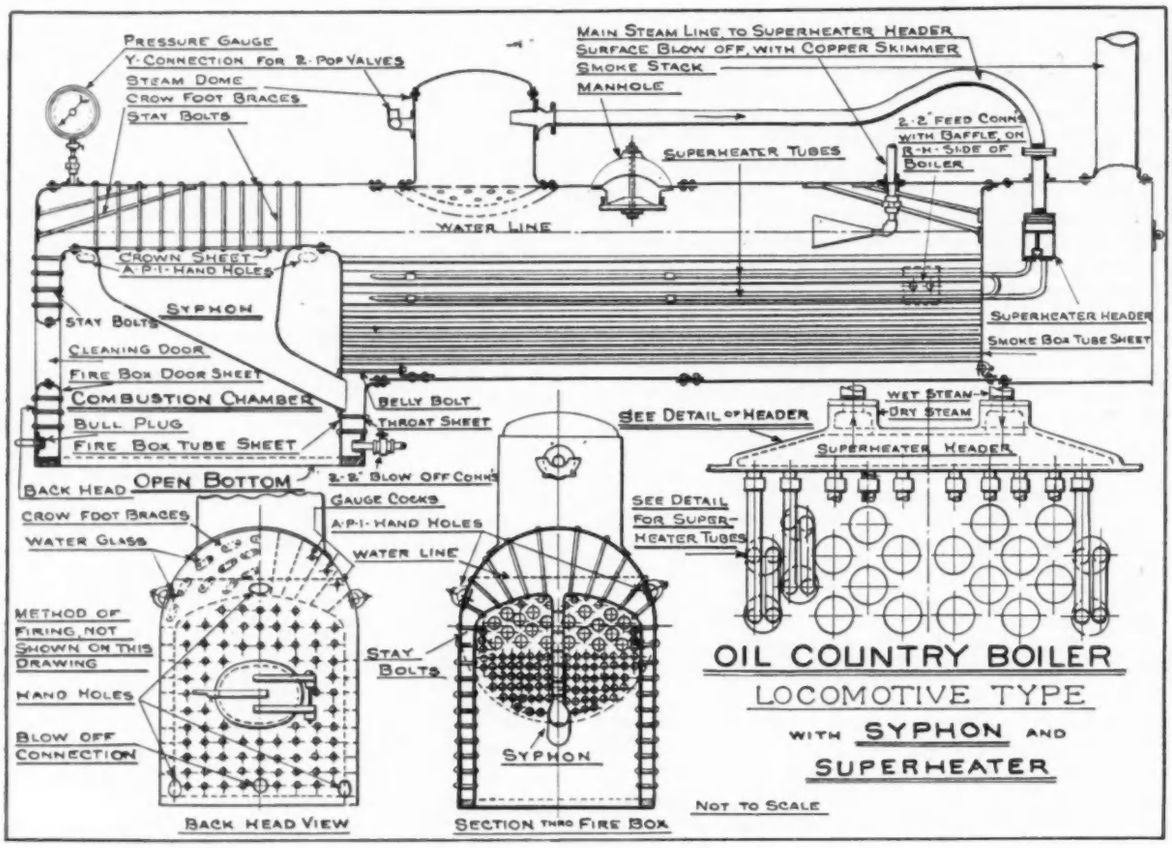
MID-YEAR MEETING
TULSA, JUNE 1, 2, 3, 1932

PROGRESS made in design of oil field boilers has been in keeping with improvements in other oil well drilling equipment, is was brought out in a paper by Hu M. Harris, Humble Oil & Refining Company, Houston, on "Recent Improvements in Oil Field Boiler Designs," at the mid-year meeting of the American Petroleum Institute division of production at Tulsa June 3.

"The features of oil field boiler design determined by recognized boiler codes tend to give similarity to boilers of any one class"; it was pointed out, "but other features, particularly concerning the fire box, flues, mud rings, syphons, and super-heat equipment, allow considerable latitude for variations in efficiencies and desirable construction.

"The open-bottom, large fire boxes, and the short and properly spaced tubes have added to the efficiency, have cut down on the weight, and have made the boilers more adaptable to varying feed waters and firing conditions.

"The outstanding trend in the design of oil field boilers," it was stated, "is to stimulate the design of the railway-type boiler for greater efficiencies and higher working pres-



Full opening bottom type mud rings are here illustrated. This type, preferred for high pressure boilers, requires use of a forged ring, and has vertical water legs formed by bringing the sheets straight down and riveting through the rings. No mud ring stay bolts are required. This type of construction allows lower setting of burners and use of a firing pit, thus adding combustion space and increased firing efficiency. Both this and the mud-bottom type mud rings should be carefully protected from furnace heat and cooling effects of the intake air, to prevent unequal expansion and leaks.

Occasionally, as in this illustration, boiler tubes are staggered in order to get more tubes in a limited area, but this arrangement lacks advantages of arrangement in vertical rows.

Syphons and super-heaters as used in locomotive boiler practice for several years have recently been incorporated into oil field boilers as an added refinement to bring about increased efficiency.

HU M. HARRIS

sures. The most notable points of simulation are the open bottom fire box, flanged collar on dome, syphons, and super heaters."

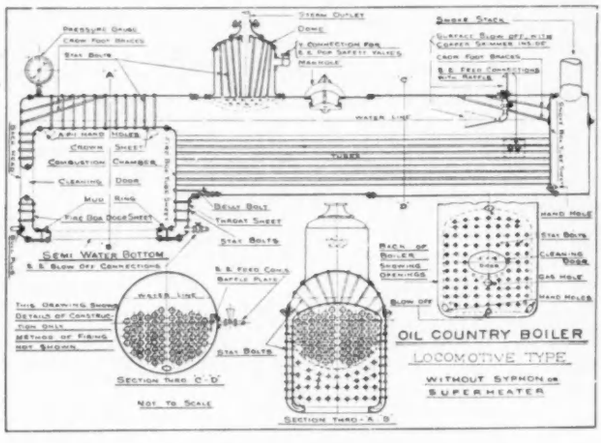
Fire Box

With regard to the fire box, the author of the paper points out that greater attention has been paid recently to increased fire box sizes, the design of which is intended to add combustion space and place as much heating surface as possible in contact with the gases of combustion at their highest temperature. Increased boiler efficiency and more rapid steaming result from the increased combustion efficiency and more effective heat transfer.

Radius of arch of the fire-box crown sheet is one of the features subject to variation at present. The arched crown sheet, shown in accompanying illustrations, approaches the curvature of the wagon top, allowing stay bolts to be threaded-in normal to the sheet to give more effective threads. It permits placing more tubes in the top row, and thus facilitates steaming. In the case of horizontal crown sheet and dome over the barrel, stay bolts are inserted at an angle, making the end threads ineffective. A horizontal crown sheet with dome over the fire box provides satisfactory vertical stay bolt connection.

Recent boiler designs have tended toward use of shorter tubes, it was stated, since there are indications that in long tubes the temperature drops as the gases approach the smoke box until heat transfer becomes inefficient. Fire box sizes and barrel diameters have been consequently increased to maintain ample heating surface, while in some instances number of tubes is increased while size is decreased.

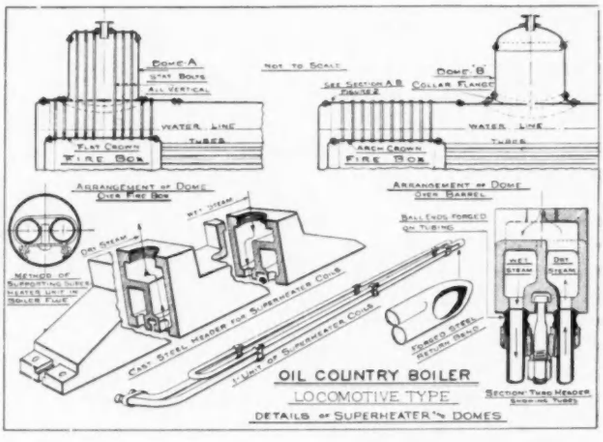
"Feed-water connections are brass-bushed," it was stated, "and are tapped directly into the shell or into a flange that is riveted and caulked to the shell."



One of the two types of construction employed for mud rings is the semi-water bottom or mud-bottom type. It has a mud ring formed of flanged steel and welded. It is built on contention that it is less subject to expansion and contraction strains and allows additional space for accumulation of sediment between blow-downs.

This illustration shows locomotive-type oil field boiler tubes arranged in vertical rows to facilitate circulation and to provide for easier cleaning.

In regard to hand holes, A.P.I. specifications call for 10 hand holes, two on each side of the outside wrapper sheet in line with the crown sheet. Some manufacturers, however, do not adhere to that specification, questioning its practicability.



Location of the dome over either the fire box or barrel is a point of contention in boiler construction, with arguments in favor of both. Some manufacturers make the location optional, while others manufacture only one type.

The dome over the fire box has the advantage of larger size, proximity to the drier steam generated over the crown sheet, and some advantages in field loading. It has the disadvantage of interference with crowfoot braces and the possibility of drawing water from the crown sheet when pop valves are open.

The dome over the barrel accords with usual railway locomotive practice; and when thermic syphon equipment is used, this location is necessary because of turbulence over the crown sheet created by the syphons. Such dome location has the disadvantage of limited size, greater distance from point of generation of steam, and inconvenience in handling in the field. Also, the dome is held to a definite ratio of its diameter to that of the barrel, unless stay-bolts are provided, in which case it may be made 80 per cent of the barrel diameter.

Railway practice in using a flanged collar for attaching the dome to the barrel has been generally adopted in the latest high pressure boiler designs. This method makes a better flanging job, and avoids the possibility of thinning out the plate as in the old designs where the lower end of the dome was flanged out and riveted directly to the barrel.

Operation of Small Wells in California

MID-YEAR MEETING
TULSA, JUNE 1, 2, 3, 1932

PUMPING wells having gross production of from 10 to 50 barrels daily constitute the subject of a paper by C. L. Moore, Chanslor-Canfield Midway Oil Company, Fellows, California, presented June 3 at the Tulsa mid-year meeting of the A. P. I. production division. The title of the paper was "Operation of Small Wells in California."

The importance of wells of this class was suggested in the statement that in California there are 8000 such wells, or about one-half the total number capable of producing, their average settled production being around 25 barrels daily.

The past four years brought low crude oil prices which caused shutting in of about 50 per cent of these marginal wells, it was stated; but for about a year there has been a definite trend toward reopening those shut in, with improved production methods reducing operating costs sufficiently to make the operations profitable at current prices.

Reasons for favoring these small wells in proration or curtailment programs were given by the author.

As preprinted by the American Petroleum Institute, this paper embraces 18 pages of type and illustrations, the latter numbering 26. There is also a valuable bibliography.

While it is brought out in the conclusion to the paper that there are many improvements yet to be made in operation of small producing wells and handling of settled production from the well to the shipping station, the paper itself describes methods which represent the latest developments in California, and which have attracted favorable attention from oil operators in that state.

Methods and equipment for pumping the small producing wells at speeds of from one to five strokes per minute are described; and economies of such operation are discussed. The requirements of ideal slow-speed pumping are given.

Equipment for continuously gaging and sampling the production of individual wells and groups of wells is described and illustrated, and the layout and principle of a direct gravity gathering system are shown. Together with automatic starting equipment, these make the operation of large leases almost automatic and remarkably economical.

An interesting feature of the paper is its presentation of data showing that with conditions encountered, counterbalancing increases the power input, a circumstance which is contrary to common experience.

At its conclusion the paper describes and illustrates some of the testing equipment which is being used.

Advantages of Slow-Speed Pumping

Results obtained by various applications of slow-speed pumping to individual wells and groups of wells are presented in tabular form, and the table is interpreted as indicating these advantages to be derived from this method of lifting fluid from small wells:

1. Substantial reductions in power consumption, averaging 50 per cent.

2. Reductions in labor demand, subdivided under two separate classifications:

(a) Surface work: No reduction in surface strings of pumpers in some applications, while in others the pumpers have been entirely eliminated due to automatic control. The repair and maintenance cost of surface equipment is substantially reduced, but no exact figures have been compiled.

(b) Sub-surface work: Slow-speed pumping practically eliminates parting of rod strings and wear of sub-surface equipment. Cleaning out operations are reduced to a minimum, as the maintenance of the critical fluid level in the well prevents the entrance of sand or shale.

3. Although no material charges are shown in the table, it naturally follows that a reduction in labor demand will effect a corresponding reduction in material costs.

Automatic Control of Slow-Speed Pumping

With regard to automatic control of slow-speed pumping, it was stated that "on one lease involving about 60 small wells, which were put on slow-speed pumping, an interesting application has been made with electric control equipment for automatic starting of the wells after a power failure has occurred.

"The small 1 to 3 horsepower motors used were wired across the line so that they would start without attention after a power failure. In order to avoid high starting loads, a special weather-proof transformer control panel was installed on the low-voltage side of each transformer bank. These panels carried a time-delay relay, so that only one transformer bank, or group of wells, was started at a time. Two single-phase watt-hour meters were included in the control panel for measuring consumption and power factor."

Handling Production from the Well to the Station

Since it is possible under proper application of slow-speed pumping for the operator of small wells to install an almost automatic and trouble-free system for lifting oil from the well and into the lead line, it was stated in the paper, he would be in favorable position to compete with the operator of flush wells if he could also automatically gauge, gather, and deliver the oil to a centrally located shipping station. Such a system has actually been installed and placed in successful operation in the Midway-Sunset district of California, it was stated.

In the automatic well gauging system which is used the fluid produced from each well is automatically and continuously gauged at the end of the lead line, where it is immediately discharged into a gravity gathering system and delivered continuously into a receiving tank at the shipping station. The free water is bled off at that bank, and the oil flowed off the top for cleaning and shipping.

The automatic gauging and gathering system has reduced average time of moving oil from the well to the shipping station from 30 days to 30 minutes, it is stated, and the system provides a complete record of production from each well. It also eliminates waste of oil from pump seepage and evaporation. Substantial reductions are made in gathering costs under the method.

A Study of
Rotary Drilling Fluids
The Effect of Drilling Mud on Production In California

A. C. RUBEL*
Union Oil Company of California

ABSTRACT

1. Properties of drilling mud as they relate to drilling problems have been studied in detail, but little attention has been given to the more important subject of the effect of such mud on subsequent production.

2. It is generally believed that mud tends to seal oil sands and perforations resulting in the loss of oil even in fields of high rock pressure.

3. The use of oil circulation and expansive scrapers or under-reamers is the only practical method at present to prevent "mudding up" before putting in perforated pipe, and the use of various forms of perforation washers is the only means of removing mud after perforated pipe is run.

4. It is chemically possible to prepare mud, or some other form of circulating medium, which will not "mud up" a sand or which can easily be removed.

5. A detailed and exhaustive study of this problem as a joint enterprise for the drilling and research group is recommended.

MID-YEAR MEETING

TULSA, JUNE 1, 2, 3, 1932

IN an effort to make as timely and as valuable a contribution as possible to the art of rotary drilling during the present year, the Drilling Practice Committee for California presents a preliminary study of drilling mud with particular reference to its effect on the subsequent production of the well.

This paper does not purport to advance new theories or to propose new methods, but rather to compile and present to the industry the general trend of thought and experience on this important subject in California, so that a clear concept of the problem may be had and a definite line of attack formed.

The properties and uses of rotary mud have been quite thoroughly studied as they relate to drilling only, but little attention has been given to the effects of such muds on the subsequent production of oil.[1]

It is this latter phase of the subject with which this paper is concerned.

A preliminary survey of the problem clearly indicates that although the majority of operators and engineers are keenly alive to the detrimental effect of drilling mud on production, there is far from a unanimity of opinion as to just what those effects are and how they should be avoided. It was, therefore, believed desirable to devote the efforts of the committee, first, to the outline of the problem in all of its ramifications, so that a concerted attack can be made on its various features.

It is the consensus of opinion that "mudding" or sealing of oil sands is, and has been, responsible for the irretrievable loss of millions of barrels of oil in California operations. This is perhaps more important in California than elsewhere in the United States, due to the peculiar nature of the producing formations and the extreme depth of the producing sands.

California producing formations are, for the most part, alternating series of soft shales and fine-to-medium-grained loosely consolidated sands, in great thicknesses. In Signal Hill, for example, there is an unbroken sequence in parts of the field of from 1800 feet to 8000 feet, and it is not uncommon to find 1200 to 2200 feet of formation open to production in a well. Other fields are of similar character. The producing depths of the more recent fields is also a factor of great importance, and it appears quite probable that depths at which production may be obtained may be definitely limited by the ability of operators to solve the problem of "mudding off" producing formations.

What Is "Mudding Off"?

The general conception of the mechanics of "mudding off" is briefly as follows:

In drilling into an oil sand, mud under a high hydrostatic head is brought into contact with oil sand of relatively high porosity with varying pressures and fluid content, and builds up on the wall of that sand by filter action a cake whose thickness, penetration, and tenacity are dependent on the differential pressure, sand texture, and mud composition. Experimental evidence indicates that the actual penetration of mud into a sand is comparatively slight; but that water, with which the mud is mixed, penetrates for considerable distances. The tenacity or durability of this

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[1] A bibliography is appended at the end of this paper.

mud filter cake is, no doubt, intensified by the mechanical action of the drill pipe, which trowels it into the formation. Few data are available from experimental work as to the relation between the pressure required to form the cake and the reverse pressure required to dislodge it or expel the drilling water from the formation; but it must be assumed, in the light of experience, that it must take considerably more pressure to dislodge the mud from the wall of the hole and expel the water from the sand than to put it there.

Under the direction of H. H. Anderson, the Shell Oil Company undertook a study of this problem in 1922.[2] Their conclusions are briefly summarized as follows:

The density of the fluid has very little effect on the thickness of deposit of mud on the outside of the formation.

The depth of penetration in 30-mesh sand was 8 to 12 times that in 150-mesh sand.

The depth of penetration of the light gravity fluids is greater than those of the heavier gravity fluids.

The total penetration of the admixing water was practically constant for all gravity fluids except the very lightest.

The depth of penetration increases with approximately the square root of the pressure.

The speed of the "mudding off" process is practically instantaneous.

The deposit, both inside and upon the surface of the hole wall, is quite permanent as long as the hydrostatic pressure on the fluid in the hole exceeds the rock pressure of the fluids—water, oil, and gas being mudded off. The deposit, however, offers no resistance to being backed out of the formation as soon as the rock pressure exceeds the hydrostatic pressure in the hole. The deposit acts only as a sheath held in place by the hydrostatic pressure in the hole.

Where the formation can be filled or mudded up as completely as possible by the original application of a mud-laden fluid under pressure, the re-application of the same or equal pressure after three hours or longer will not effect any further penetration or taking of mud by the formation. However, if the pressure in the second application is greater than it was in the first or original application, then the final penetration is approximately the same as if the greater pressure had been applied in the first place.

It is believed that the plastering action of the drilling bit compacts the mud deposit on the surface of the hole, inhibiting the formation from taking its full quota of mud at the equivalent mudding pressure, but forming a much better and stronger sheath than obtained in undisturbed mudding.

It is believed that a mud wall or sheath built up with the rotary bit is far superior to any sheath which can be obtained by breaking down the bit-compacted sheath and attempting to rebuild same by undisturbed mudding or "supplemental circulation."

It is believed that the so-called absorption of mud in a hole during "supplemental circulation" is in reality an absorption of water by the formation and a deposit of additional mud on the inner wall of the hole. The water is probably transferred through the existing sheath by a process analogous to capillary or sponge action.

The efficiency of the mud-laden fluid is materially reduced by the sand which is picked up from the hole cuttings. Both the speed and depth of penetration are considerably decreased. To get best results, the fluid should be separated as freely as possible before it is re-introduced into the hole through the mud pumps.

The result of more recent work is furnished by H. H. Farnham[3] as follows:

"A filter press was constructed in which drilling mud was pumped at 1000 pounds per square inch pressure against a filter medium of sand. The first few drops of filtrate which passed through the sand was muddy water, and of the total filtrate approximately 95 per cent was clear water. The constant pressure of 1000 pounds was held on the drilling mud until no further filtration occurred. The time required for complete cessation of water-flow ranged from 20 minutes to 60 minutes. The press was then opened, and the thickness of deposited cake was measured. All drilling muds used in the tests were prepared to a uniform viscosity of 10 centipoises, as determined on the Stormer instrument at 600 r.p.m.

Filter Cake Thickness Required to Stop Water Flow at 1000 Lb. Per Sq. In.

Clay	Cake Thickness (Inches)
Specially prepared bentonite	⅛
Oklahoma mud	1
Coalinga mud	1⅛

These tests show that little or no mud leaves the bore hole, but that the mud solids are filtered out and are deposited on the walls of the hole. The water present in the original mud, however, is forced into the formation to distances and in quantities imposed by the previously mentioned limits.

The thickness of filter cake set opposite each type of clay indicates the wall thickness required to stop all loss of water into the formation at 1000 pounds per square inch differential pressure. A corresponding increase in thickness of cake is required to stop all water infiltration at differential pressures in excess of this. In many cases the depth of the well is such that a thickness of cake is required which is greater than the radius of the bore hole, and the infiltration of water is never completely stopped. The scraping and rotating action of the drill pipe also may dislodge some of the filter cake, and allow water to penetrate into the formation continuously during the drilling operation. It behooves the operator, therefore, to use a drilling mud which will deposit that type of wall which offers the greatest resistance to flow per unit of thickness. This is the drilling mud which contains the greatest percentage of gel-type colloids.

Add to these conditions a string of perforated pipe of from 80- to 250-mesh, fitting the hole with a small clearance and acting as a reinforcing medium, and the sealing effect of the mud sheath and difficulty of removal are further intensified.

It is the elimination of this mud cake, either by the prevention of its formation or its subsequent removal by mechanical or chemical means, as well as the prevention of water infiltration into the sands, that is the subject of this study.

The effect of the partial water saturation of an oil or gas sand and its subsequent expulsion has received too little attention, although it is probably a matter of almost equal importance to that of mud. Van Mills did some extremely interesting work with the U. S. Bureau of Mines some years ago, which has apparently never been published. He demonstrated experimentally that the pressure required to displace oil in a sand with water was much less than to displace water in the same sand with oil. The differential pressure required varied inversely with sand porosity. A study of relative surface tensions and movements through capillary spaces should throw light on this subject.

In high-pressure flush fields the problem is not of vital importance, although it becomes increasingly so with increased depth of drilling. Evidence in Kettleman Hills, one of the highest pressure fields in the country, indicates that in spite of its high rock pressure, producing wells continue

[2] Furnished through the courtesy of the Shell Oil Company.
[3] Baroid Sales Company of California.

to make mud and drilling water in decreasing amounts months after completion.

In semi-depleted fields, however, where formation pressures have declined to small figures, the problem is most serious. There are numerous instances on record where in sands known to be capable of 50 to 250 barrels per day production no oil can be commercially produced at present with rotary drilled holes, and where, unless other means are employed, large reserves of oil will be lost to the industry. There are hundreds of acres of such territory in California, particularly in the Maricopa-Midway, Elk Hills, and Coalinga areas.

Unless some other means than the present rotary system of drilling is developed, most of the oil under these conditions is lost forever.

What Will the Committee Study?

In analyzing the problem for future study, it is the purpose of this committee to emphasize the following phases:

1. A study of cause and effect of mudding with the object in view of a possible modification of the composition of the mud to eliminate or minimize its detrimental effect. It has been suggested that a new circulating medium might be devised which would have similar transporting power and specific gravity, but which could be more readily removed by chemical or mechanical means. It is hoped that in the future study of this phase of the problem sufficiently definite specifications may be devised to enable the research committee to apply themselves to its solution.

2. A study of how to remove the mud wall once formed so that the maximum sand surface in a newly drilled well may be exposed to production. This phase of the problem may be attacked by mechanical or chemical means, and here again it is hoped that the research committee may cooperate.

3. A study of how to clean out and remove the mud from old producing wells which were never properly cleaned when placed on production, or which have been mudded up by adjacent operations.

4. A study of the changes in the properties of mud under the conditions of extreme heat and pressure encountered in modern deep drilling. This is probably an extremely important item, and one upon which there is nothing available in the literature on the subject. Experience in Kettleman Hills and Ventura Avenue deep wells strongly indicates a rapid and marked increase in viscosity and perhaps in plasticity with heat and pressure. It seems quite possible that stuck-pipe from so-called "caves" or "slumps" in the hole may more logically be charged to critical changes in the physical properties of the mud itself under pressure and heat.

5. As a logial sequence to the foregoing, a study of new or modified methods of drilling should follow without, if possible, the use of circulation of any sort.

A Questionnaire Was Sent Out

With a view to collecting the results of experience and thought from those best qualified, the following questionnaire was circulated and the answers compiled:

1. Do you believe that drilling mud is responsible for loss of production? Please give specific examples of "mudding up" producing formations either in drilling or re-drilling operations.

2. What precautions are you taking to prevent such occurrences in: 1, drilling operations?; 2, re-drilling operations?; 3, clean-out and repairs?

3. If you use oil or any other circulating medium, please give your experience as to its effectiveness in preventing the sealing off of producing formations, or any methods which you have developed for its use.

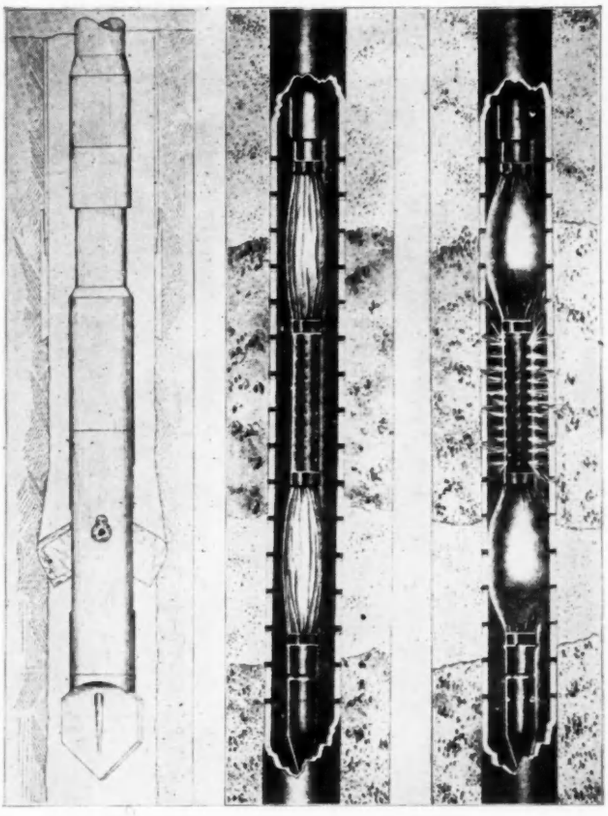

FIGURE 1 **FIGURE 2**

4. What is your practice in completing a well for removing the mud?

5. What are your experiences with mechanical devices, such as perforation washers, casing swab, etc., for opening up the formations?

6. What is your experience with chemical mixtures either for the treatment of mud or its removal?

To the first query the replies were unanimously in the affirmative, with the general qualifications that the detrimental effects of mudding were in a large measure dependent on the rock pressure of the producing sand or, more properly, on the differential pressure between the sand and that exerted by the mud column. A number of examples were submitted to show the loss of production in flush or semi-flush areas, and a larger number to show the effects in semi-depleted areas. It was suggested in one instance that it may be quite possible that areas of relatively low-pressure sands may have been completely passed up in wildcat operations, and there is considerable evidence to support such a contention.

To the second question there is some difference of opinion as to the best mud mixture to use in order to minimize the "mudding up" effect on the sand. The advocates of thin mud have little to offer in its defense other than that light mud builds a thinner filter cake on the wall of the hole which is easier to remove.

The majority of opinion favors comparatively thick mud, such that the maximum cake is formed in the shortest time. The argument in favor of this practice is that a quickly-formed cake will quickly seal the formation against the infiltration of water. It is then an easier problem to clean off the sand face on completion than to expel water a distance from the sand face.

There is also a strong suggestion that, in penetrating the sand, drilling water may carry in suspension silt or other

FIGURE 3

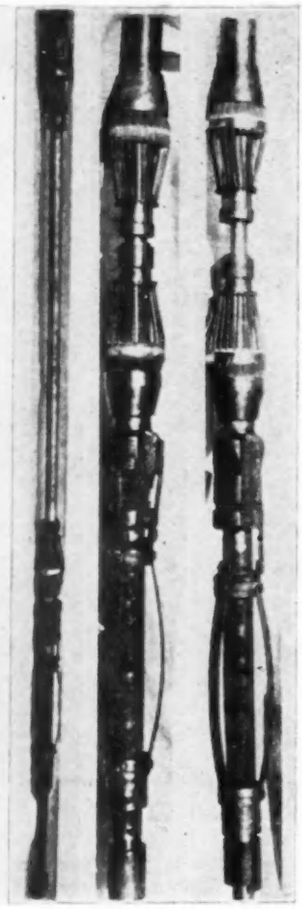

FIGURE 4

finely divided matter which will be deposited in the interstices of the sand, further restricting the flow of oil or gas.

After full penetration has been taken, it is the practice of the majority of operators to under-ream or scrape the hole with an expansion scraper, using a very light drilling mud or oil. The liner or oil string is then run as quickly as possible, and the hole again washed with oil or water before completion.

In areas of low pressure, such as are now encountered in the producing zones of Signal Hill, Santa Fe Springs, and Huntington Beach, it is particularly important to guard against the effects of mud. In most cases the holes are drilled into the oil sand with mud, but are scraped or under-reamed with oil before running a liner. Before placing the well on production, however, one of the various forms of perforation washers is used, and the hole washed and bailed until no more mud or sand can be recovered. The well is then put on the beam, and alternately pumped and cleaned out for several weeks before finally exhausting its mud and drilling water.

An ingenious method of meeting this difficulty in the very low-pressure area of Elk Hills is described by Frank E. O.'Neill[4] as follows:

"In the early part of 1924 the Pan American Petroleum Company drilled several wells in the Elk Hills in what might be termed 200-barrel pumping territory. The wells were bailed until they were apparently clean, then tubing was run in with a packer and the wells swabbed through the tubing for several days, at which time the tubing was pulled and the wells again bailed clean to bottom. After this work was done, the wells were tubed and put on the beam, using the equipment which was customary for that property. They started pumping at a 30 to 40-barrel rate, which was fully 150 barrels a day less than adjacent wells.

"It was decided to drill 20 feet of hole ahead of the shoe of the oil string, and proceed to bail and swab the well, without any casing in the new hole, in an attempt to cause the open hole to cave around the shoe of the oil string and allow the impervious material to run down along the outside of the perforated casing, so that it might be bailed out from the bottom of the well. After swabbing and bailing for a few hours we began to get large quantities of heavy mud, oil sand, and shale into the bottom of the well. This was bailed out; and, as soon as the hole was bailed clean, the swab was run in again and an additional charge of this material drawn into the bottom. After about five or six days of this treatment, no more mud and shale could be drawn in, and very little sand was obtained. There appeared to be no change in the fluid level after this work, but the wells were put back on the beam with the original equipment, pumping at a 220-barrel rate."

When Must Cable Tools Be Resorted To?

When formation pressures have reached a point where circulation cannot be maintained, it is then necessary to resort to cable tools or the so-called "dry hole rotary" developed by F. F. Hill.[5]

The use of this system of drilling clearly demonstrated the detrimental effects of mud in the Richfield area in Orange County. In one instance a well was drilled by the "dry hole method" in an area with a 40-barrel maximum production from surrounding wells and completed for 300 barrels. In a second instance, a well was completed with mud for 10 barrels, and was later re-drilled by the "dry hole method," in the same interval, and re-completed for 150 barrels.

Various kinds of drilling muds are used in California operations mixed with various weighting and colloid-forming materials, and there is a wide difference of opinion as to proper weight and viscosity for different field conditions. In only a very few cases is oil used as a drilling fluid, although its use in reaming or scraping the hole preparatory to completion is becoming quite common in semi-depleted territory.

It has been the writer's experience in using oil for drilling that is does not readily mix with the shale in the hole; but forms a very tough, plastic sheath on the bit, tool joints, and pipe collars that cannot be washed off, but must be chopped and pried loose with a bar or hatchet. It may be assumed that if such a sheath forms on the tools, it also forms in the hole; and although it probably does not penetrate the sand, it certainly would form a difficult barrier to remove.

A common practice is to drill the full penetration of producing sands with mud-circulation in the usual manner. The mud is then replaced with water, and the water with oil. The entire face of the producing interval is then scraped (Figure 1) with an expanding wall scraper using oil circulation. With a scraper which will remove, from one-half to one inch around the wall of the hole, any mud cake should be effectively removed. It must be borne in mind, however, that the transporting power of oil is less than mud, and that a longer time and greater rate of circulation are necessary to obtain the same results.

Since oil readily absorbs gas which lowers its specific gravity, it cannot be used with safety in high-pressure sands. The Union Oil Company in the Dominguez field has made a practice of scraping all wells in the lower sands

[4] Frank E. O'Neill, "Improved Production Methods in California Fields."

[5] F. F. Hill, "Sub-circular Increased Production," *Oil Field Eng.*, Aug. 1930, p. 14.

before setting the liner. These sands are of relatively high pressure, and the wells often attempt to "blow in" during the operations, and in some instances flow from five to 20 barrels per hour while scraping. The wells thus treated are provided with blow-out preventers of the type which permits rotation and the vertical movement of the kelly under pressure. A flow bean is provided on the outlet of the casing to restrict the flow or close in the well completely if necessary. No difficulty is experienced so long as the circulating oil is cold and gas-free, but after a few times around it becomes gassy and so light that it is difficult to make a connection or to pull out of the hole. A tank of cold gas-free oil is connected directly into the circulating pump suction, and a similar change of oil is made whenever needed. In sands where pressures are not great, such precautions are, of course, unnecessary. In low-pressure sands, where oil will enter the formation, circulation cannot be maintained, and this method has no value.

The use of mechanical means for breaking down and removing mud from the hole after the screen pipe is set, or for subsequent cleaning-out operations, is becoming quite common. Typical tools for this purpose are illustrated as follows:

Figure 2 shows what is known as the "safety perforation cleaner," which works on the principle of expanding two collapsible canvas packers by pump pressure, after which the fluid is forced through the perforations, in the packed-off interval, and to the surface around the upper packer. The tool is effective in formations which will support circulation, but obviously cannot be used to advantage otherwise.

Figure 3 indicates what is known as the "standard oil well cleaner," which operates on the same principle, although the mechanical method of securing a pack-off is different. A fluid pressure of approximately 225 pounds is required to expand the packing rubbers, after which fluid is open to the 24-inch interval to be washed.

Figure 4 indicates what is known as the "McGregor-Strang cleaner," which works on the natural fluid level of the well without circulation. The operations are as follows:

The illustration on the left shows slips closed in position to run in well on tubing or drill pipe. The right illustration shows the slips set, as with a hook-wall packer, to hold the weight of tubing. The tubing or pipe is then raised and lowered through a five-foot stroke, as shown in the center illustration, which causes the fluid to surge in and out of the space between cups. After washing a five-foot interval, the tool is re-set five feet above or below, and the operation repeated. Such sand and mud as may be brought into the hole must be removed by bailing.

The obvious advantage of this tool is that it places no hydrostatic head on the producing sands in excess of the natural level.

Figure 5 illustrates what is known as the "Yarbrough vacuum cleaner," which works on an entirely new principle, depending on neither pump nor surge-circulation for its operation. The tool consists of a barrel hung on slips with an interval packed-off with Guiberson swab cups. A rubber-packed plunger slides in this barrel, and is actuated by raising and lowering the tubing. The barrel and plunger are fitted with a standing and traveling valve, respectively.

In operation, the plunger is pulled to the top of the barrel; the tubing is lowered, setting up a vacuum in the annular space above the piston. At almost the end of the stroke the piston passes into an enlarged chamber, and the vacuum suddenly released acts directly on the perforations, in the interval between the Guiberson cups, pulling into the lower barrel such mud, sand, and fluid as may be loosened. On the next down-stroke the material is forced through the traveling valve and into the tubing. Thus, the material cleaned from the perforations is removed with the tool. After this interval is cleaned, the tool is re-set and the operation repeated. Experience indicates that in the use of this, or other forms of washers, it is desirable to combine the process of cleaning the perforations with bailing and swabbing in the perforated string in order to get the maximum effect on the sand. This instrument has been used very successfully in Santa Fe Springs and other Los Angeles basin fields.

There are many other types of washers, down-swabs, and agitators used; but the ones here illustrated represent the types most successfully employed.

The action of each of these tools is to break up the mud cake between the perforated casing and the wall of the hole, as well as to open up the perforations. Their action, if effective, and causes mud and sand to enter the well, where it must be removed with the tool or by bailing with some form of common or suction bailer of which there are several excellent types. Operations of this sort are yielding very satisfactory results.

In several recent instances in the Meyer and Nordstrom zones at Santa Fe Springs, the production from wells after cleaning with the suction washer has increased from 100 to as much as 1700 barrels. The use of such tools in new wells, to insure that the perforations are open and exposed to the sand, is becoming a standard practice in certain of the lower pressure areas.

Little work has been done along the lines of chemical treatment of mud in California, except in the addition of bentonites or weight materials. In 1927 Phelps and Lake made several tests in Huntington Beach using nitre cake dissolved in hot water to form a cheap acid. Inasmuch as local muds carry large proportions of calcarious material, it was thought that the action of the acid would destroy the bond in the mud cake and that the liberation of carbon dioxide would assist in its disintegration. The mixture was used in two wells; and, although subsequent bailing showed quantities of mud and sand, there was no apparent good done to the wells. It seems probable that there was insufficient agitation to do more than attack the surface of the mud sheath, after which an equilibrium was established

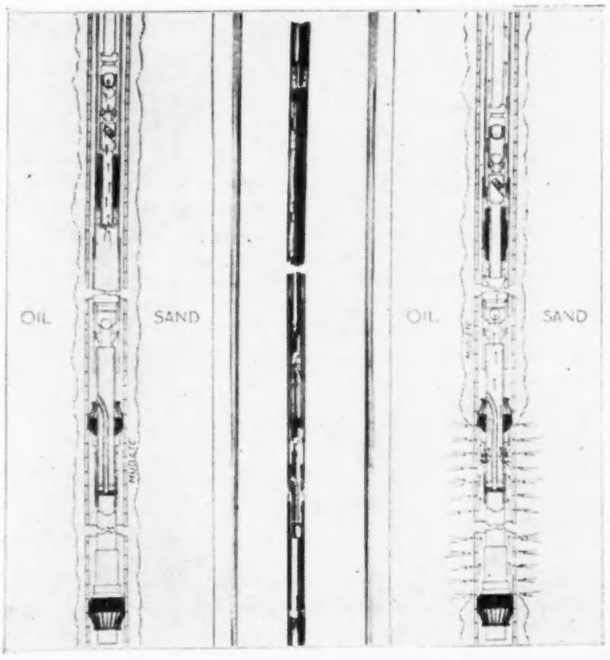

FIGURE 5

preventing further chemical action. Lactic and dilute commercial sulfuric acids have been used for the same purpose with no better success.

It is the suggestion of the California committee that much might be accomplished in this manner with the assistance of the research group. The problem should be attacked from both the angle of new wells, where it would be possible to treat the mud in advance; and for those already drilled, in which there may be evidence of mudding from the original drilling.

Muds Can Be Chemically Treated

A very pertinent suggestion is offered by Albert J. Rainey,[6] as follows:

"The method of treating drilling muds with chemicals permits the new application of an old principle of converting liquids into solids by the process of crystallization. Water, a very mobile liquid, is crystallized or converted into the solid state (ice) by the reduction of temperature, and in such condition it loses all of its mobility. In the chemical industry there are numerous examples of this change from the liquid to the solid state either by physical or chemical action. Although this process is used in many branches of the industrial world, it has only recently been applied to the technique of oil well drilling. Its principal use is in restoring or preventing lost circulation. When a chemically-treated mud begins to enter a porous formation to the extent that circulation is lost, a different chemical substance may be added which will start the process of crystallization, thus changing a part of the liquid mud into solids. In areas where there has been an accumulation of the chemically-treated mud, as in a cavity or a very porous stratum, this process of crystallization continues until it has built up a strong, rigid, impervious wall with large crystals, thus preventing further circulation losses at that point. This formation of crystals by chemical action is not rapid enough to cause the drill pipe to stick. Proper regulation of the chemicals delays the action several hours. When the hole is re-entered to resume drilling, the treated mud can be drilled through without trouble; but it has become set enough to prevent further loss of circulation. When the lost circulation has been recovered, the wall of the hole soon becomes covered with a thin plastic coating containing chemicals that will solidify similar to any other portion of the hole. To use the term of the driller, it has been 'mudded up,' and is ready for the making of new hole.

"After drilling has been ompleted and the well ready for washing, another chemical substance is added which causes the crystals to dissolve, so that they may be washed out of the hole. The chemicals used in this process are not excessive in price, and have no injurious effect upon the casing or the cement."

It is apparent from this brief and incomplete presentation that there is definitely a serious problem confronting the industry from this source, and one that is vitally connected with the conservation of our oil and gas resources. It is the recommendation of the California Drilling Practice Committee that the various phases be assigned for detailed study as joint problems with the research group, having the object in view of making a complete and exhaustive study of this very important problem.

[6] Hydraulic Engineering Co., Ltd., Los Angeles, California.

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This paper constitutes the first of a group of three sectional discussions of drilling mud. The problem in the Southwestern District is handled by Stanley Gill, and in the Mid-Continent by C. P. Parsons. These sections will be presented in early issues.

Kessler Sees Benefit From Conference Despite Failure

NEW YORK, JUNE 3.

J. B. AUG. KESSLER, managing director of the Royal Dutch-Shell Group, who sailed for London aboard the Majestic Friday said before his departure that he refused to feel down hearted as a result of the failure of the international oil conference which came to an abrupt end Thursday.* On the contrary he expressed his pleasure in having found that leaders of the American oil industry have done an enormous amount of constructive thinking and in having discovered here a disposition to approach and come to grips with problems heretofore regarded as hopelessly baffling. He said that such aims and inclinations on the part of leaders of the various corporations and national units of the oil industry of the world are prerequisite to any solution which may be sought now or in future. He said that the courage of Mr. Arnott and other American leaders in attacking problems of such magnitude and the co-operative and constructive spirit which moved European leaders to cross the ocean for purposes of conference outweigh in ultimate importance the mere failure of their first attempt to reach an agreement along international lines. Much has been accomplished in his opinion in the exchange of ideas which occured here and in the clearing of this first hurdle along the course which must be run.

Assembly Important Step

All is not lost he said. The mere assemblage of the oil industry's leaders marked an important step forward and other constructive steps may be taken in connection with the oil states compact and the Roumanian oil industry conference which has been called to convene at Paris late in June. He stressed the importance of the successful outcome which is hoped for in connection with these two projects and said that it is not indicated that the industry should be discouraged unduly simply because of failure to negotiate an agreement with one national unit, referring to the Soviet section. In his opinion it is much better to have terminated the Russian negotiations than to have erected an unsound and artificial structure of alliance which might only have prolonged the final solution of current problems.

He said that he does not expect any dramatic situation to result from the failure of the New York conference and that it is improbable that the competing groups will at once fly at each others' throats in relentless price warfare. Continued instability of Europeans and export price structures are inevitable on the other hand as a result of the pressure of excess oil production.

Being at breakfast when interviewed he illustrated the impossibility of pouring a pint of water, representing the world supply of petroleum, into a half pint measure, representing world demand, without incurring waste.

He remarked that no agreement was approached during the whole three weeks of the conference, not even remotely, and explained that the proposals and counter proposals which were advanced from time to time were found to be wholly incompatible and to afford no common ground whatsoever. He refused to discuss detailed causes which contributed to the failure of the conference and held that post mortem discussion to assess culpability in that connection could accomplish no useful purpose.

Displaying a disposition to continue to look ahead, he said that the oil industry is in an excellent position to assume leadership in seeking an avenue of escape from the chaos and wreckage of the depression. Automotive industry, for example, is unable to assume such leadership, as it must await a return of confidence on the part of the people; but the oil industry in contrast has not suffered so severely in the decline of consumption. He said indeed that the oil industry has already taken the measure of the decline of consumption, which is not expected to fall below present average. The remedial measures which are required are found to lie within the grasp of lawmakers who need only to make it possible for industrialists to employ their constructive talents and specifically, for the several component units of the oil industry to embark jointly upon such plans and courses of action as each would want to undertake individually if competitive and legislative conditions would permit.

—International

J. B. AUG. KESSLER

Laws Force Drilling

He said that no individual or company would be so foolish as to drill more wells than necessary or so shortsighted as to produce more oil than could be sold, except under pressure resulting from archial laws which forbid cooperative action.

Benefits resulting from the stabilization of the oil industry would at once be felt in steel and in other basic industries he said, with consequent improvement in conditions of employment and restoration of confidence in other spheres of human endeavor. It is his opinion that a general restoration of public confidence which is so necessary to put an end to the economic depression might well be founded on a re-habilitated oil industry.

He deplored the development of conditions which have forced him and others similarly placed in international trade to specialize in the study of international exchange, national currencies, finance, banking, traiffs, laws, and legislation and said that it is his dearest wish that he could devote all of his time to oil without having to consider gold, silver and kindred subjects of such complexity. He said that if he had his wish such subjects would remain as closed books to him.

He deplored the development of industry along national lines, which means the splitting up to the world's economic structure in to a large number of isolated national units, with the result that a key industry in one country, which not only supplies its home market but also manufactures for export, and similar key industries in other countries, become directly antagonistic toward one another. In such circumstances he said it is only logical that the endeavor of each of these industries and the spirit which guides their leaders is bound to be directed toward elimination of their competitors. His opinion is that cooperation within industry should be developed within certain clearly defined limits between industries manufacturing the same primary products. Such coordination should not be based on the subdivision of the world into national

*See page 13.

units but rather upon its subdivision into industrial units.

What the world needs, he said, is a structure of trade and industry which will secure the regular supply of its requirements in goods on the most economical level; in other words, by international cooperation along simple but logical lines, the flattening out of the present steep ups and downs in the supply of goods, which must inevitable be accomplished by steep rises and falls in price.

He warned that planning along national lines must interfere with the free exchange of goods, because its tendency is to close markets. This must lead, he said, to direct antagonism between similar industries in different countries, and instead of having achieved cooperation the world will be divided into isolated national units bent on economic agression. The exchange of goods between world producers and the world consumers, or in other words, the supply of the world's requirements, would inevitably become subjected to political bargaining between governments. International trade would deteriorate into economic apraisals to an even larger extent than is the case today.

Advisory Committee Proposes Ten Per Cent Production Cut

TULSA, JUNE 3

After giving consideration to the present economic situation as it affects the production and marketing of crude oil and having taken into consideration the attitude expressed in the American Petroleum Institute meeting, the Oil States Advisory Committee, today, recommended a reduction of 10 per cent of the allowable as determined by the committee at Austin, Texas, March 8, 1932.

The New allowable is to be as follows: Arkansas, 41,000; Louisiana, 60,000; Kansas, 117,000; Oklahoma, 515,000; Texas, 780,000; California, 425,000; Rocky Mountain, 45,000; New Mexico, 45,000; Eastern States, 108,000; total, 2,136,000.

Reviewing the situation the committee stated "at this time approximately 200,000 barrels of oil is being taken from storage and ordinarily this would indicate a strong market and a happy prospect for an increase in the price of crude. But the liquidating policy of purchasers is now of controlling the depressed situation. Such a policy makes the independent producer carry the burden of retaining his production underground in order that the above ground stocks may be reduced. Again the producers take it on the chin but apparently there is no alternative.

"Acting for the commonwealth's producing oil we warn the oil companies that never again will the states suffer their natural resources to be taken without compensation. Therefore any concerted attempt to reduce the price of crude to the producers will be followed by drastic measures being adopted by the oil states to prevent such a calamity."

It was recommended that the new allowables be effective if and when the oil excise tax becomes in force and to continue until January 1, 1933, or until further revised. The old allowable as determined in the Austin meeting totaled 2,373,000 or 237,000 more than the June 3 recommendation.

East Texas Wells Without Connections Increasing

Dallas, June 23.—Crude purchasers in the East Texas field could provide for only a small percentage of the large number of unconnected wells at the semi-monthly meeting of the pipe line committee held here June 2.

A cleanup of nearly all unconnected wells was generally anticipated as result of well allowable being cut five barrels to a new low quota of 54 barrels daily beginning June 1.

The committee did succeed in providing pipe line connections for 15 of the 52 leases listed as being in in need of transportation and market relief.

A total of between 80 and 100 wells was believed to be without connections prior to the meeting as some operators have failed to appeal to the committee, which is headed by John G. Pew of Dallas. The attitude displayed by representatives of the purchasing companies against the extension of lines to take on new leases indicates that market troubles are in store for the field should the present volume of new drilling activity be maintained. Crude buying companies particularly resent the growing practice of small companies and operators in dividing the ownership of small tracts so as to create more drilling sites and selling off a corner drilling site from a lease with a view of creating an extra offset as an excuse for the sinking of an additional well on the original tract.

Oklahoma City, Okla., June 3, Torrential rains which fell Thursday night, June 2nd, brought operations to a standstill in the Oklahoma City pool and producers were having difficulty getting around to the wells to produce the allowable.

No reports came out of the field the following day due to the fact that scouts found it impossible to enter the area.

Basements in all downtown buildings were flooded with as much as six feet of water, and the entire northern portion of the pool was inundated.

All compressor stations and gasoline plants were shut down and many of the small refineries were reported under water.

At a late hour on Friday five bodies had been recovered and a score were reported missing.

Train schedules from all directions except from the north were interrupted.

Hobbs Extension Requires Drilling Three Offsets

Hobbs New Mexico.—Immediate drilling of three offset wells to the Amerada Petroleum Corporation's Hardin 1, an outpost well on the northwest end of the Hobbs field will be required as result of the latter's flowing at rate of 220 barrels of pipe line oil per hour through open three-inch tubing from regular lime horizon at 4105-58 feet. This well is located in the southwest corner of Section 18 and more than a half mile from nearest production. It proves conclusively that the northwest trend on production is wide open for additional extensions because of logging all key formations at normal depths.

Buttonwillow-Lost Hills Wildcat Flows Salt Water

Bakersfield, Calif.—Graham-Loftus Oil Corporation is abandoning Carmel 1, a wildcat test on Section 20-27-22 and about midway between the Buttonwillow gas field and Lost Hills, at 6605 feet after an unsuccessful production test. The shale near the bottom of the hole showed gas, but caved badly and testing was difficult. A liner was run to 5600 feet after the hole had been cleaned out a short distance below the 5¾-inch shoe at 5720 feet.

CALIFORNIA FIELDS

Ready to Test Another Productive Zone. No Information on North Belridge Test

BRAD MILLS, *Staff Representative, Los Angeles, California*

Testing Temblor at 9578 Feet on North Dome Edge

Coalinga, Calif. — North American Oil Consolidated drilled into shale at 9578 feet in Elsinore 1, North Dome edge test, and it is believed that this formation is the Kreyenhagen shale which has been sought as a definite marker upon which to base another production test. Coring was stopped and a string of 4¾-inch casing will be cemented at 9135 feet for a test of the lower portion of the Temblor now open. The drill pipe froze at 9563 feet, but was loosened and pulled in good order. If the lower portion of the formation fails to produce a plug will be set and the zone below 8450 feet will be tested. The upper portion of the formation was tested several months ago, but production was oil and water, with only a small amount of gas. There is a possibility that the upper part of the zone may contain water and very little gas, but such a condition would not necessarily eliminate the upper portion. The well seems to be located very nearly on the dividing line between the outside leases and producing leases on the flank of the North Dome. Shell Oil Company's Dixon 1, an offset was completed with an initial production of 6000 barrels from 8807 feet, but the top of the Temblor contained water and was plugged off. It is only natural that the water level would be lower as the outside of the field is approached.

Superior Oil Company will complete Huffman 4 at 8600 feet, after establishing a speed record which may stand for some time. This well was started the last days of February and drilling has been rapid and uniform. The 6000-foot level was reached in a month, and the well should be completed under 3½ months.

Standard Oil Company of California is drilling in hard gray sand and shale in No. 6-29V, Middle Dome test which will be re-completed to test the lower portion of the Temblor formation. Deeper drilling in this well has been more or less an experiment, as a production of about 1250 barrels of 53 gravity oil was obtained above 8000 feet. Testing of the well showed it had only limited possibilities, however, and deeper drilling was necessary to prove the condition of the intermediate and lower Temblor.

It is doubtful that Petroleum Securities Company will be able to complete Burbank 1, Middle Dome test, due to the bad mechanical condition of the hole. Milling on iron continues at 5181 feet, but continued fishing and milling have weakened the shutoff string. Drilling of a new well from the surface might have been cheaper, but it was impossible to determine what would be encountered in mechanical handicaps. The well is understood to have cost around $650,000, but no official figures have been released.

Owners Withhold Dope on North Belridge Test

Bakersfield, Calif.—Accurate comment on Belridge Oil Company's No. 64-27, deep test in the North Belridge field, is very difficult, in view of the extremely secretive nature of the company. Scouts from companies having acreage in the field have had no better luck in "shaking down" Belridge Oil Company's superintendents and engineers than rank outsiders. The depth of the hole has been placed at 8060 feet, but it may vary one way or another.

While running liner of swabbing a few weeks ago, the well blew in and flowed wet gas at the rate of 50,000,000 cubic feet before sanding up. Such a performance in an entirely new zone was important, and it is possible that a heavy production of light oil will be developed in or below the base of the Temblor zone. The top of the formation was found around 5000 feet, and a thickness of more than 3000 feet would be unusual.

It is known that the Temblor should be very thick in the North Belridge field, but more drilling will be required to show the nature of the zone. At Kettleman Hills, the Temblor formation may be slightly less than 3000 feet thick, but a uniformity is not be expected. A liner will be set another test made. Plugging back probably does not mean that the lower portion of the formation will be plugged off.

Drilling of the well makes a very interesting experiment in a field which two years ago was a sensation in the upper part of the Temblor formation.

Deepening Program Underway at Playa del Rey

Los Angeles. — Deepening of several wells to the schist at Playa del Rey may help to maintain a larger number of active wells than have been drilling during the first part of the year. An extensive revival of field work should not be expected, but deepening of edge wells on the larger leases does offer a chance to increase production with a minimum outlay and trouble.

Pacific Shore Oil Company is rigging to deepen Ballriech 2 from 5675 feet, and will include the maximum producing zone below the present bottom. This well was a good producer when first completed and should make a representative test.

Herndon Development Company plans development of a large lease southeast of the producing sector along the ocean front, on the theory that the southeast trend will continue. Recent completion of a good well on the Vidor lease by Union Oil Company makes the extension very possible. Two or three wells have been drilled in the district, but the results were not conclusive. The proposed drilling will be on the high hills some distance from the ocean, and as near a continuation of the axis as possible.

Redrill Well Which Showed Oil at Coal Oil Point

Santa Barbara, Calif.—A revival of operations at Coal Oil Point is expected to show the possibilities of the original well drilled by Bolsa Chica Oil Corporation, but it should not definitely prove or disprove the entire structure, as the first well shows evidence of having been located on the plunge of the anticline. McDonald and Andrews have acquired Permit 191 from Bolsa Chica Oil Corporation and will work over the first well drilled on the state permit. This well was first drilled to about 4190 feet, plugged back to 4150 feet and tested below the main shutoff at 4020 feet. The high gas pressure and rich cores were enough to point to a high production of light oil, but inclusion of too much formation below the shutoff appeared to have prevented a successful production test.

First production was about 2000 barrels,

of which the greater part was water. Changes and adjustments only made matters worse, and it developed that highest percentage of oil was produced during the original test. The hole will be redrilled from 500 feet to the top of the Temblor at 4017 feet, another string of 8⅝-inch casing run and a test made of the zone which looked best during the first test.

Superior Oil Company took over the well last year and drilled it into the Sespe at 5510 feet without favorable results. There was always doubt as to the condition of the shutoff string.

Huntington Beach Deep Possibilities Discounted

Huntington Beach, Calif.—Huntington Beach seems definitely out of the way as a potential deep producer, but there is still a local element that believes in the possibilities of formations below 7000 feet. The fact that one or two wells did flow a limited amount of oil is taken seriously by many operators who are anxious to have their properties tested in the future. The wells drilled by Superior Oil Company, W. E. McCaslin and others showed some promise at various levels, but all fell short of commercial production. W. E. McCaslin's Transport 17 produced a small amount of oil, but a satisfactory water shutoff was never effected.

There are various geological reasons why the field should not produce, and perhaps as many why it should. Long Beach seems to be the center of deep production along the Newport-Beverly fault, and as distance is gained in either direction, the deeper zones are not so promising.

California Field Developments

Completions

Company, Well and Location—	Production Bbls. Initial	Depth
KERN COUNTY—		
Graham-Loftus Oil Corp.'s Carmel 1, 20-27-22	*	6605
LOS ANGELES COUNTY—		
L. W. Rucker's No. 1, 26-1-17	*	900
ROUND MOUNTAIN—		
California-Western Oil Co.'s No. 8, 7-28-29	350	1590
WEST COYOTE—		
Standard's Emery 51	150	4220

New Operations

INGLEWOOD — Pacific Western Oil Co., Rubel 16, 8-2-14.

KETTLEMAN MIDDLE DOME—Universal Consolidated Oil Co., Bunting 1, 25-23-18.

MIDWAY—Fred D. Turner, Turner 1, 22-32-23.

SESPE—Harmon and Deal, No. 2, 33-5-19.

TULARE COUNTY—Sheldon and Gholson, No. 1, 34-22-27.

Wildcat Drilling Report

(Wells shut down not included)

NORTHERN CALIFORNIA

KERN COUNTY

BLACKWELL'S CORNER — F. Fowler's Lincoln 1, 15-26-19, will sd, td 1200 ft.

BUTTONWILLOW — Milham Exploration Co.'s S. P. L. 14-9, 9-28-23, shut in, td 2670 ft; S. P. L. 32-7, 7-28-23, rigging up rotary; S. P. L. 41-7, 7-28-23, tested lower formation at 2575 ft, no gas, will perforate higher and test.

DELANO—Delano Oil Co.'s No. 1, 2-25-26, new lcn, may not sp.

DEVIL'S DEN—C. B. Gauthier's No. 1, 24-25-18, dr shale 328 ft. Thomas Hannah's No. 1, 25-25-18, dr shale 3300 ft. T. H. Purman's No. 1, 22-29-21, repairing rig, td 3962 ft.

McKITTRICK—Welport Oil Co.'s No. 2, 19-29-21, dr shale 200 ft; No. 8, 26-29-21, co 1300 ft.

SEMITROPIC — Fullerton Oil Co.'s No. G-1, 1-27-22, rigging rotary.

SHALE HILLS—Rio Grande Oil Co.'s Utting 1, 7-27-19, dr shale 875 ft.

WHEELER RIDGE—Barnsdall's K. C. L. 1, 15-11-20, dr shale 6800 ft.

SANTA BARBARA COUNTY

CARPENTERIA — Texas' Community 3-1, 33-4-25, dr shale 1700 ft.

GOLETA—General Pet.'s More 1, 21-4-28, re-dr 2900 ft, td 4523 ft.

LOMPOC—O. C. Field Gasoline Corp.'s McLean 1, 6-7-33, will not drill now.

LOS ALAMOS—Barnsdall's Careaga 1, 31-8-33, dr shale 4515 ft.

SANTA MARIA—Western Gulf's Bradley 1, 5-9-33, dr shale 9428 ft.

SANTA ROSA ISLAND—Standard's No. 1, building roads to new lcn.

ZACA LAKE—M. H. Casey's No. 1, 11-8-31, lcn.

VENTURA COUNTY

HOPPER CANYON — Bardeen Oil Co.'s Lankershim 2, 13-4-19, dr oil sand 2465 ft.

OXNARD—Magu Syndicate's Utt 1, 17-1-21, fsh for drill pipe 5815 ft.

PIRU—Torrey-Ventura Oil Co.'s No. 1, 32-4-18, dr shale 3020 ft.

RINCON—Woodrow Pet. Corp.'s Woodrow 1, 4-3-24, sr 2417 ft.

SESPE—Harmon and Deal's No. 1, 35-5-19, grading for lcn. H. A. Ivers' Star 7, rigging cable tools.

SOUTH MOUNTAIN—H. H. Bell's Lenon 1, 22-3-21, sd 2460 ft.

SULPHUR MOUNTAIN — Wilshire Annex Oil Co.'s No. 1, 20-4-21, grading for lcn.

TIMBER CANYON — Superior Oil Co.'s West 1, 13-4-21, grading for lcn.

MISCELLANEOUS

KINGS COUNTY—Magee and Stone's No. 1, 34-24-22, dr shale 4665 ft. Kettleman Reef Ridge Oil Co.'s Seymour 1, 10-23-16, pulled all casing and reran 10-inch cas to 850 ft, td 1150 ft; No. 2, 10-23-16, lcn. Knudsen and Schmidt's Avenal 1, 36-23-17, co 5650 ft. Dudley Dome Oil Co.'s No. 1, 9-23-20, dr shale 375 ft. E. B. Guess' No. 3, 12-23-22, swabbed, no gas, td 1840 ft. Lacal Natural Gas Co.'s No. 1, 32-22-20, dr shale 350 ft. Scott Brothers Well Drilling Co.'s No. 1, 18-22-19, dr shale 1315 ft. Glen Woodward's No. 1, 32-22-20, dr shale 400 ft.

MONTEREY COUNTY—Pacific Inland Oil Co.'s No. 1, 19-23-15, will cmt 6⅝ inch cas at 1860 ft, td 2340 ft.

SAN LUIS OBISPO COUNTY—Emerich Oil Co.'s Holland 1, 22-32-22, dr shale 1414 ft. Kent and McDonald's No. 1, 3-32-22, re-dr 960 ft, td 2675 ft.

STANISLAUS COUNTY—Rushing Oil and Development Co.'s No. 1, 20-3-13, dr shale 2565 ft.

TULARE COUNTY—Gravity Exploration Co.'s Hudson-Buck 1, 11-24-23, co 2110 ft. Sheldon and Gholson's No. 1, 34-22-27, lcn.

YOLO COUNTY—Pacific Northern Gas and Oil Co.'s Guinda 1, 23-12-3, dr shale 2750 ft, gas showings.

SOUTHERN CALIFORNIA

FULLERTON—Buena Park Oil and Dev. Co.'s Langstaff 1, 34-3-11, lcn. Orangethorpe Corp.'s Skinner 1, 32-3-10, dr hard rock 1945 ft.

HERMOSA BEACH—Tulsa Oil Co.'s Hermosa 2, 6-4-14, co 3155 ft. Westwood Oil Producers' Hermosa 2, 6-4-14, pumping some oil, td 2145 ft.

LYNWOOD—William L. Jones' Graham 1, 31-2-12, repairing rig, td 1572 ft.

MONTEBELLO—Allen McNiel's Fee 1, 7-2-11, lcn.

NEWHALL—Walter T. Ball's No. 1, 34-3-16, fsh for bit 1365 ft. Southern California Drilling Co.'s Newhall 2-1, sr 775 ft.

NEWPORT—Nuoil Co.'s Banning 2, 29-6-10, will deepen from 1975 ft.

PLAYA DEL REY—Cooperative Development Co.'s No. 1, 26-2-15, 13⅜-inch cas cmt 515 ft, td 1525 ft.

PUENTE—Eldorado Oil Co.'s Baird 1, 30-2-9, dr shale 2775 ft.

SAN DIEGO COUNTY—Itasca Pet. Co.'s Mesa 1, co 1565 ft.

Gato Ridge Discovery Well Maintains Steady Output

Santa Barbara, Calif.—Barnsdall Oil Company and Rio Grande Oil Company are continuing the production test in Tognazzini 1, discovery well in the Gato Ridge field, which was plugged back from below 6000 feet to around 2500 feet to open up a new field. Initial production was about 1000 barrels, and the output has held remarkably steady at about 700 barrels. This heavy oil may be mixed with lighter Elwood crude and sold for various purposes. The heavier crude has much better anti-knock qualities than the lighter product, and also makes a superior fuel oil. A pipe line from the field is being considered.

Mt. Poso Wildcat Finds Nothing in Vedder Zone

Bakersfield, Calif. — Gulf-Verde Oil Company probably will be forced to abandon Glide 1A, wildcat well west of the Mt. Poso field, having drilled into the Vedder zone and found it barren. Top of the formation was found at 2449 feet, and drilling to 2460 feet showed a gray sand which contained no oil. The well is located on Section 19-27-28 and is across the fault line from the Mt. Poso field. It is less than two miles from production. The company has completed derrick for a test on Section 28-26-28, near the north extension to the Mt. Poso field, and may continue operations in the district.

Ventura Deep Test Still Promises to Make Record

Ventura, Calif.—Associated Oil Company is drilling slowly ahead at 9472 feet in Lloyd 83, deep test in the Ventura Avenue field, and will make a production test around 9600 feet if present plans are carried out. A heavy gas pressure makes progress slow. The last cores showed hard shale and streaks of good oil sand. With the seven-inch casing cemented at 8579 feet, the impending production test should prove interesting. The well is one

of the deepest potential producers in the world and should become a record producer for at least a short period. A few other wells are now drilling at greater depths, but it is believed that none has so good a chance to establish a new record as Lloyd 83.

In two or three California fields, where several zones produce, the top and bottom formations are most extensive, with the middle zones pinched in to some extent. Enough drilling has not been done at Ventura Avenue to determine the relative sizes of the deepest and shallower zones.

Buttonwillow Well Plugged Back for Good Gas Flow

Bakersfield, Calif.—Milham Exploration Company has completed No. S. P. L. 41-7 as one of the best gas wells in the Buttonwillow district. After failure to make a satisfactory completion at 2573 feet, the 8⅝-inch casing was perforated and the upper zone tested above the shoe at 2410 feet. The original completion plan called for 6⅝-inch liner for a test of the lower zone, but little gas was developed. The gas flow was estimated at 20,000,000 cubic feet and added materially to the field's potential.

A large supply of gas has been developed in the Buttonwillow district, but none is now being marketed. Lines have been completed and the field is expected to supply a good part of the total used by both Los Angeles and San Francisco. None has been used from the district because it has been possible to keep it shut in satisfactorily while Kettleman Hills was sending its gas north and south to prevent waste.

Round Mountain Extension Test May Stimulate Drilling

Bakersfield, Calif. — Chanslor-Canfield Midway Oil Company has made location for its first well on an 80-acre lease on the west trend of the north Round Mountain extension, and completion of a good producer might lead to additional drilling. The small extension north of the Round Mountain field has not been a large producer, but the shallow depth at which production is found and the fairly consistent completion record make the district attractive.

The main Round Mountain field was discovered five years ago, and has been alternately active and quiet. The extension to the north was caused by faulted conditions. The field lies along the upthrow and will never be a sensation. The oil contains only a small percentage of gasoline, but it has good lubricating qualities.

California Market Outlook Best It Has Been in a Year

California production has been brought down at a remarkably fast rate and is now only slightly above the new allowable of 476,700 barrels. A slight reaction to the downward pressure is possible, and the output may settle at a larger figure than the minimum for any one day, but the steady drop from around 520,000 barrels to less than 480,000 barrels was an outstanding achievement. Some of the fields actually fell considerably under their allotments, and it is for that reason that a slightly higher production than the lowest of the past week may be recorded.

The Ventura, Santa Barbara and Kern County fields met their quotas quickly and even registered smaller totals than allowed. Long Beach still is over its allowable, while Dominguez, Huntington Beach and Playa del Rey are only slightly over their allotments. Ventura Avenue has been sharply under its allotment.

Both the independent and major operators have cooperated to bring about the lower state total. The independents took the lead immediately after the defeat of the Sharkey bill, and it was the first time since curtailment started that such has been the case. The majors remained in the background, but cut back to meet requirements of the new plan.

Reduction of production at Dominguez to around 17,000 barrels was a real achievement and cured a very sensitive situation. Only three companies are in the field, and all were majors and supposed sponsors of curtailment. Their failure to hold the field down did not show the good faith many of the independents demanded. It is true that lease requirements entered into the overproduction, but a smaller production could have been recorded.

The state output has not looked better for more than a year, and there is every possibility that the excess will be very limited in the immediate future. Some of the most troublesome fields are under better control, and the natural decline will soon show its effect.

Gasoline prices have been softer for the lower grades, but no change has been posted for the higher grades.

Meeker, Colo.—Magnolia Petroleum Company has cemented a string of 6⅝-inch casing at 2914 feet just above the gas sand in its Piceance Creek well, Rio Blanco County, NW SE Section 9-2s-96, which is bottomed at 2936 feet, and it is announced will complete the test as a gasser at that depth. The well is good for more than 13,000,000 cubic feet in a formation believed to be in the White River series. The company is considering drilling another well on the structure to develop more gas which would find a market if piped to Ohio Oil Company's line from the Baxter Basin and Hiawatha districts, southwestern Wyoming, into Utah and Idaho. This would be the third well on the structure, the first having been completed some years ago as a smaller gasser than the one now standing cemented. Well is known as Maddock 1.

Official Report Gives Oklahoma Line Valuations

Oklahoma City.—According to A. I. Thompson, engineer for the Oklahoma Corporation Commission, 21 pipe line companies own 22,057.39 miles of trunk and gathering lines in Oklahoma. Costs as reported by the companies are $112,706,572.06 for trunk lines and $47,980,299.89 for gathering lines, making a total of $160,686,871.95. Costs and mileage by companies are as follows:

Company	Cost	No. Miles of Lines
Ajax	$ 3,108,261.54	198.77
Cosden	6,034,359.23	505.47
Champlin	1,506,892.46	459.51
Consolidated	1,277,246.08	263.20
Continental	5,468,513.43	741.29
Empire	6,329,091.30	763.19
Gulf of Oklahoma	11,370,401.09	2,100.37
Gulf of Penna.	1,321,845.76	87.47
Great Lakes	2,299,788.28	194.00
Healdton	122,779.90	84.18
Illinois	979,160.85	374.39
Magnolia	10,204,918.26	1,139.71
Oklahoma	22,505,371.21	2,041.56
Operators	48,732.24	5.51
Prairie	35,448,623.82	5,424.66
Pierce	619,207.69	50.62
Shell	14,191,292.13	1,093.76
Stanolind	23,946,834.43	4,876.01
Sinclair-Texas	2,938,080.09	195.10
Texas-Empire	3,724,147.48	179.35
Texas	7,021,427.95	1,248.48
Thurber	219,996.73	30.81
Totals	$160,686,871.95	22,057.39

Wichita Falls, Texas.—Independent refiners in the vicinity of Wichita Falls are contemplating a jointly owned pipe line to extend across the State line to Devol, Oklahoma, a distance of about 18 miles, to permit the loading of gasoline in tank cars destined for points north in order to overcome a $13 per car freight rate handicap that prevails in competing for business with Oklahoma, or Group Three plants. A three-inch line would be ample to handle such shipments to Oklahoma, and the saving in freight rates would soon amortize the pipe line investment.

OKLAHOMA FIELDS

Wilcox Sand Gives Big Output in Oklahoma City. Seminole June Production Should Be Less Than May

FLOYD SWINDELL, *Staff Representative, Tulsa, Oklahoma*

Two Big Wells Mark the Week For Oklahoma City Drilling

Oklahoma City.—Tests on two gushers and a rather spectacular oil fire featured Oklahoma City news for the week. Saturday at noon lightning struck the treating tank at Coline Oil Company's Jennie Clauer 16, SE NW SE, Section 25-11n-3w, in the southern portion of the pool. Flames quickly spread to the well and to a nearby storage tank. The Kinley Brothers of Tulsa placed a shot in the cellar blasting out the flames and removing the melted christmas tree which had handicapped efforts to control the well. Due to a high wind and lack of facilities to handle the flow of oil, operators decided to reignite the well until it could be brought completely under control. A second shot was successful in snuffing out the flames and it was brought under control at 8:30 p.m. Monday evening, May 30.

Grison Oil Company's Turner 1, NW SW SE Section 34-12n-3w, in the northern portion of the pool, was opened for three hours and 22 minutes, during which time it produced 12,327 barrels and was estimated at 70,000,000 cubic feet of gas. Calculated at this rate for 24 hours the well has a potential of approximately 87,840 barrels, making it among the largest in the pool. On the first hour it produced 3218 barrels, increasing to 3928 barrels the second, and dropping to 3218 barrels the third hour when an offset well was opened. Within a few minutes after the third hour of testing the well started cutting out and had to be closed in. Production is coming from Wilcox sand with nine-inch casing set near the top at 6330 feet. This is one of the last wells which will be permitted to complete with the nine inch string set on or near the top of the sand, a practice which was inaugurated by Phillips Petroleum Company and one which evidently has resulted in greatly increased initial yield.

Phillips Petroleum Company opened Still 1, SE NW NE Section 3-11n-3w, for a test of 10,390 barrels in three hours, flowing through a 5 3/16-inch choke. The 24-hour calculation at this rate would be 83,120 barrels. When completed last month it flowed 7707 barrels in three hours through a four-inch choke and subsequently flowed 4835 barrels in 1½ hours through a 4¼-inch choke.

Seminole June Production Will Be Less Than in May

Seminole, Okla.—Pools of the general Seminole district are to have a net allowable of approximately 4,219,695 barrels for June compared with 4,421,982 barrels for the preceding month. Due to recent completions in the Fish and West Seminole pools, definite figures are not now available but it is believed that little or no increase will be granted these pools above that shown in the umpire's report as of June 1. The Fish pool was granted 3500 barrels daily allowable for May and West Seminole 2700 barrels, or a daily total of 6200 barrels. This figure probably will not be increased above 6500 barrels. Potentials on the new wells in Fish and West Seminole will be available about June 10 when proration shut down time has been complied with. Status of the district as of June 1 was as follows:

Pools	April Allowed Runs	April Actual Runs	June Potentials	Net Allowed Runs for June
Allen	249,718	248,938	18,210	248,502
Asher-Wanette	126,277	115,361	9,222	117,981
Bowlegs	350,956	349,977	26,137	343,204
Carr City	471,729	383,927	23,342	307,899
Earlsboro	360,012	348,581	23,873	354,875
East Earlsboro	275,878	260,654	20,318	273,517
South Earlsboro	112,382	109,968	6,642	90,464
E. Earls'b Extension	7,060	8,381	531	5,688
Earlsboro Townsite	50,568	50,251	3,538	51,314
Fish	107,483	111,369	Est. 26,780	Est. 112,500
Konawa	161,796	147,710	12,067	151,566
Little River	520,299	535,915	40,281	518,942
E. Little River	57,385	55,262	4,165	62,141
Maud	45,901	40,354	2,709	48,192
Mission	206,699	212,184	15,448	195,245
Sasakwa	49,783	49,160	2,594	50,427
Searight	102,452	101,634	6,683	99,239
Seminole	326,859	324,778	24,116	328,346
East Seminole	34,612	34,476	2,370	33,943
West Seminole	79,939	81,328	Est. 10,000	Est. 82,500
St. Louis	530,523	511,056	34,558	514,763
Wewoka Townsite	119,029	91,547	5,002	116,967
Strippers	134,700	134,700	3,716	111,480
Total	4,282,040	4,307,511	321,302	4,219,695

Note: For comparison with May see page 46, May 9, 1932 issue THE OIL WEEKLY.

Oklahoma City Allowable Lowered for June

Oklahoma City.—Purchasers in the Oklahoma City pool took cognizance of an anticipated general decrease in demand for crude during June when they reduced nominations approximately 8000 barrels daily in the Corporation Commission hearing held here May 28. The commission set 97,300 barrels as the daily allowable for June as compared with 105,821 barrels for May, a decrease of 8521 barrels. Production will be allocated as follows: Arbuckle limestone wells, 2000 barrels per day flat to be distributed among the operators as provided in a previous order; wells outside of the Arbuckle limestone making three per cent or more water, 10,200 barrels or 100 barrels each for 102 wells; new wells estimated at 4316 barrels daily; 18,275 barrels daily based on a 25-barrel exemption on 731 eligible wells outside the lime zone; and 63,575 barrels based on 1.75 per cent of the estimated potential of 3,575,693 barrels. The Corporation Commission potential is one-third of that based on 24-hour calculations.

According to estimates by the umpire's office brought out through the testimony of E. G. Dahlgren, current under-production for May will reach 177,473 barrels. May production was estimated at 3,283,287 barrels and May pipe line runs at 3,256,209 barrels. Stocks on May 1 totaled 611,293 barrels and it was estimated that stocks as of June 1 would be approximately 638,371 barrels. This is considered a reasonable amount of storage.

The next hearing to determine demand for the Oklahoma City pool will

be held June 28 and a statewide proration hearing is planned for the same date. Any changes in demand during June will be taken care of in special meetings to be called when and if necessary.

Grady County Community Test Near Contract Depth

Tulsa.—Carter Oil Company and associates were drilling below 4100 feet in Community-Carson 1, SE SE SE Section 12-3n-8w, wildcat test about 2½ miles south of production in the old Chickasha gas field in southern Grady County. Contract depth is understood to be 4500 feet but it is likely that drilling will be carried deeper, as that depth probably will do little more than penetrate the Permian. However, the test is north and west of the Wichita Mountains and approximately on a line projected through the axis of that system of folding, and may encounter a subnormal thickness of Permian below which it might encounter Wilcox or other Simpson sands. Community interests are as follows; Carter Oil Company, 85.75 per cent; The Texas Company, 3.17 per cent; Gypsy Oil Company, 6.85 per cent; and Magnolia Petroleum Company, 4.22 per cent.

Oklahoma Field Operations

Completions

Company, Well and Location—	Initial Production Bbls.	Depth
CREEK COUNTY—		
Swift et al, Nichols 2, ne c sw 1-18-8e	50	2432
J. E. Wallace, W. Tompson 1, se c sw 7-19-9e	15	2195
Elliott Bros., G. Smith 1-A, c ne se 18-19-9e	20	2216
Vensel et al, J. Boyd 1-A, ne ne sw 28-19-9e	*	2311
Gled Oil, F. Boyd 1, ne c nw 29-19-9e	90	2179
Carter et al, Stewart 1-A, sw ne nw 32-17-12e	150	2408
JEFFERSON COUNTY—		
Monarch Petroleum, Briggs 1-A, swc 36-3s-4w	*	4583
MUSKOGEE COUNTY—		
Babcock Bros., Barnett 1, c sw se 8-15-15e	8	1640
OKFUSKEE COUNTY—		
Misener et al, Johnson 5, sw nw nw 12-10-11e	8	1622
OKLAHOMA COUNTY—		
Phillips Pet., Nellie 1, sw se ne 3-11-3w .....6536 5¾ hrs ¶56	6358	
Slick et al, Central 1, se ne se, 3-11-3w .....4 hrs.	446	6410
Phillips Pet., Carney 1, nw nw ne 22-11-3w .....5 hrs. ¶8-410		6549
Phillips-Aladdin, Garver 1, se nw ne 22-11-3w .....4½ hrs. ¶9-210		6511
I. T. I. O., Goldie Lord 1, c se ne ne 35-11-3w .....8 hrs. ¶6½-2683		6620
J. S. Cuniff et al, Orphanage 1, sw ne se 17-12-4w	*	6700
OKMULGEE COUNTY—		
Basinger, McAdoo 1, sw c nw nw 32-14-12e	*	3050
PAWNEE COUNTY—		
Hay et al, J. Copeland 10, nwc sw sw 26-20-9e	7	2100
PONTOTOC COUNTY—		
Edna Marie et al, Constance 1, se ne ne 20-5n-6e	*	1825
POTTAWATOMIE COUNTY—		
Barnsdall et al, Gray 1, c ne ne sw 25-6n-4e .....(21 hr.)	1473	3490
SEMINOLE COUNTY—		
Empire, Fish "D" 3, se c 19-7n-8e .....14 hrs.	57	3088
Minnehoma, Noe 3, nwc 17-9n-6e (owpb) .....12 hrs	40	2792

New Operations

BECKHAM COUNTY—Allman-Ramsey et al, Marcum 1, c sw sw 22-9n-23w.

CREEK COUNTY—Wilrough Oil, O. U. R. R. W. 2, swc ne nw 32-17-12e. H. H. Taylor et al, Green 1-A, cnl s½ se 28-19-8e. Willby et al, S. Brunner 1-A, cwl se nw 31-19-8e. Tulsa Oil, W. E. Bough 2, nwc ne 22-19-9e. Gled Oil, M. Boyd 5, swc nw ne 29-19-9e.

GRADY COUNTY—Lesh-McCall, Slaton 1, c nw nw nw 35-4n-7w, formerly reported as Geo. Schumaker, Slaton 1.

MUSKOGEE COUNTY—P. Boyle, Barnett 1, nwc sw ne 25-16-15e.

OKFUSKEE COUNTY—Louis Stekoll, Likowski 1-A, esl n½ ne sw 23-11-11e.

OKMULGEE COUNTY—Rositer Oil, Burgess 7, cnl ne nw 20-12-13e.

PAWNEE COUNTY—Ray Spees, Tweedy 1-A, swc nw nw 14-20-9e, formerly reported as ne c nw. Krasne Drlg., N. Mitchell 3, swc nw se 27-20-9e.

POTTAWATOMIE COUNTY — Mid-Continent, Archer 4, c se se se 14-6-3e. Gypsy Oil, Horn 6, c ne ne 23-6n-3e. Thelgor, Janovey 1, se nw se 33-9n-5e. Brown, Santer 1, c nw nw nw 35-11-4e.

SEMINOLE COUNTY—Droppleman, Charty 1, c ne sw sw 29-6-6e (owdd). Dave Malarnee, Tucker 1, c nw sw nw 32-6-6e. Spears Drlg., Phillips 1-A, c ne se sw 17-9-6e.

STEPHENS COUNTY—Western Oil, Palmer 1, c nw ne se 31-1s-8w. Geo. Pace, Bristow 1, swc ne se 18-2s-7w. Geo. Pace, Houston 9, c ne se sw 2-2s-8w. English Drlg., Nigh 1, ne c sw 11-2s-8w.

Wildcat Drilling Report

(Wells shut down not included)

KAY COUNTY—Blubaugh et al, Indian 1, c nw se 30-25-1e, sd 2293-2305 ft td.

ELLIS COUNTY—L. C. Hivick et al, Roper 1, c se nw 21-20-24w, rog.

NOBLE COUNTY—Wentz Oil Corp. et al, Wolff 1, c se nw 17-20-2w, rig.

LINCOLN COUNTY—Hilton Phillips, Phillips 1, sw nw 2-14-3e, plugging back from 5080 to 4305 ft. Sovereign, Selacek 1, ne se, 3-12-5e, plugging back to test Hunton at 4551 ft, will shoot pipe.

POTTAWATOMIE COUNTY—Brown et al, Souter 1, nwc, 35-11-4e, cellar. Iron Mountain & Clara O&G, Brown 1, sw nw ne, 1-9-4e, pulling casing to abn.

WASHITA COUNTY — Burns & Prince, Dock 1, swc, 21-8-18w, S. S. O. 1645-50 ft, td sd.

PITTSBURG COUNTY—Moffett & Hall, Jones 1, c ne nw, 14-8-14e, spd.

KIOWA COUNTY—Christian, James 1, ne se, 8-7-18w, ur at 1158 ft.

PITTSBURG COUNTY—Tape Oil Co., Fulton 1, se c, 34-7-14e, dr 2050 ft.

PONTOTOC COUNTY—Sunray, Grant 1, c se ne, 11-4-8e, lcn.

PITTSBURG COUNTY — Ruby Ann Oil, George 1, cel nw se 3-4-16e, sd 1282 ft.

GRADY COUNTY—Carter et al, Community-Carson 1, se c, 12-3-8w, dr 4090 ft. English Drlg. Co., Heenan-Coe 1, ne se ne, 32-3-7w, dr 1315 ft.

PONTOTOC COUNTY—Edna Marie Oil, McWhirt 1, ne se, 11-2-6e, lcn.

COMANCHE COUNTY — Trahan-Wilson, Pruitt 1-A, ne sw se, 8-1-9w, sd 1600 ft.

Move to Regulate Taking Of Oklahoma City "Waste"

Oklahoma City.—Ray M. Collins, state proration umpire, has issued orders that all purchasers of Oklahoma City crude from tank trucks make reports on the same and that all truck drivers secure permits from the umpire's office before going on a lease to remove so-called waste oil. Lease owners have been notified that all pick-up oil not reported and for which no permit has been issued, will be charged against the lease allowable.

Apparently a new racket has sprung up by which small refineries are able to secure their demand in oil which would bring considerably less than the market quotation. Much of the oil so moved is believed to be waste oil but there appears the possibility that oil may be intentionally run into pits and streams and immediately picked up in such a way as to sustain but little loss in gravity. One refiner is reported to have handled about 30,000 barrels of so-called waste oil within the last 60 days and another 18,000 barrels during the same period.

One producer recently reported that valves on two lease storage tanks had been opened during the night and oil permitted to flow into a nearby stream. Early the next morning trucks were picking it up and hauling it to a nearby refinery.

Seminole.—Blackwell Oil & Gas Company is pumping 50 barrels daily from Fleet 1-A, NW SW NW Section 13-5n-7e, old well drilled deeper in the Allen area in southeastern Seminole County. First Wilcox sand was logged at 4195 to 4210 feet. With the second Wilcox sand barely penetrated at 4300 feet, operators had a hole full of water and plugged back to 4216 feet.

The Texas Company's Reed 9, SE NE NE Section 14-8n-6e, in the Bowlegs pool, an old producer deepened from 4350 to 4385 feet, is rated at 125 barrels daily after being shot with 20 quarts. Amerada Petroleum Corporation's Chase 2, SE NE SW Section 29-9n-6e, in the relatively new West Seminole pool, had Wilcox sand from 4072 to 4100 feet, and swabbed 530 barrels the first 12 hours.

Barnsdall-Gypsy et al's Gray 1, NE NE SW Section 25-6n-4e, discovery well in the new West Konawa pool, is rated at about 1500 barrels from the upper Simpson at 3487 to 3490 feet. On May 19 it produced 1470 barrels in 20 hours and on the following day, 1310 barrels in 23 hours. This test ran more than 700 feet structurally higher than the discovery well in the Sacred Heart pool, approximately six miles to the north.

KANSAS FIELDS

Curtailed Purchases Are Announced for Kansas. Barton-Ellsworth Area Is Spotted.

FLOYD SWINDELL, *Staff Representative, Tulsa, Oklahoma*

Pipe Line Companies Take Less Oil From Kansas Wells

Wichita, Kansas.—Skelly Oil Company advised operators at Voshell that effective Wednesday morning, June 1, it would reduce its takings from 4000 to 3000 barrels daily and on June 6 a further reduction will be made to 2000 barrels daily.

Production and pipe line runs have been averaging about 6300 barrels daily based on an allowable of 53 per cent of potential. Of this amount Skelly Oil Company has been taking approximately 4000 barrels daily, Shell Petroleum Corporation, 2200 barrels, and the remainder by Derby Oil Company, which handles only its own oil. Skelly Oil Company has been tendering oil for Barnsdall Oil Corporation. Other purchasers having lines into the pool are White Eagle Oil Corporation, Prairie-Sinclair Pipe Line Company, Phillips Petroleum Company, and Texas-Empire Pipe Line Company. Skelly Oil Company's move is based entirely on the fact that it, as well as other purchasers, is experiencing a slight general decrease in demand and is attempting to take care of the situation by curtailing runs in various areas to which it is connected rather than shut off from any one area.

An announcement of considerable importance to producers in the settled areas was made when White Eagle Oil Corporation notified that in the unprorated areas on and after June 1 it will follow the policy of taking all of the oil through its connections, paying for half and taking an option to buy the other half from storage within 12 months or it will take one half of the oil from its connections and pay for all. Under this plan storage charges would be made for the one half taken under option to buy within 12 months. Several Kansas purchasers have felt that producers in the settled area should bear a portion of the burden of proration rather than to cut allowable to such a low percentage in the flush and semi-flush fields. Attempts were made to influence the Public Service Commission to apply a small reduction in allowable production from settled areas but no success was had. It now appears that this end will be gained by action of individual purchasers in reducing their takings. However, this will probably work to a disadvantage in many instances since desirable connections may be lost to smaller purchasers who are willing to take all of the oil from any certain property or group of properties.

Central Kansas Spotted Condition Further Shown

Wichita, Kansas.—That the Barton-Ellsworth Arch area of central western Kansas will be spotted and practically every test a wildcat regardless of the offset situation was further indicated last week when H. K. Beardmore et al missed a showing in the conglomerate and had a hole full of water in the Arbuckle limestone in Stoltenberg 1, SE NE SE Section 22-16s-10w, three quarters of a mile east of the Palmer-Gypsy Stoltenberg 1, which had an initial yield of 85 barrels the first hour from Arbuckle at 3333 to 3348 feet. Beardmore et al are abandoning at 3395 feet.

Pottawatomie Test to Be Made in Simpson

Seminole.—Amerada Petroleum Corporation has decided to pass up temporarily Viola lime production and test the Simpson formation in Mitchell 1, NE NE NE Section 3-6n-4e, in the new Sacred Heart area, Pottawatomie County. Simpson was topped at 4228 feet and an increase in oil obtained from 4230 to 4237 feet. At 4241 feet the well swabbed 90 barrels of oil in five hours but most of the production was thought to be coming from the Viola. The test is said to be running about 40 feet structurally higher than offsets.

Kansas Field Operations

Completions

Company, Well and Location—	Initial Production Bbls.	Depth
COWLEY COUNTY—		
Hinkle et al, Bertrand 1, swc se sw se 22-32-4e	210	2439
GREENWOOD COUNTY—		
Haver et al, Teegarden 1, c sw sw ne 16-23-11e	*	2110
Criswell, Lowery 2, c sw sw 22-26-9e	*	2300
McPHERSON COUNTY—		
Gypsy Oil, Lovett 1, c se sw nw 24-19s-2w	1022	3396
SEDGWICK COUNTY—		
Shell Pet., Bryant 1, swc 11-26-2e (owdd) 12 hrs.	47	3162½
Gypsy Oil, Hamant 6, c se nw nw 14-26-2e 20 hrs	202	2865
Continental-Gypsy, Lambe 1, c se se nw 12-26-1w (owdd) (last report)	40	3339
SUMNER COUNTY—		
Tighe et al, Therson 1, c nw se se 22-34-2e	50	3500

New Operations

COWLEY COUNTY—Ben Gralapp, Weigle 1, nw sw nw 9-32-4e, formerly reported sw sw nw. Roth et al, Southwestern College 3, ne nw se 22-32-4e, formerly reported No. 2. Dickey Oil, Tibbits 1, ne nw ne 27-32-4e. McCole, Hepler 1, ne sw ne 27-32-4e. McKnabb, Snyder, sw nw ne 27-32-4e. Murphy et al, Reservoir 1, nw nw ne 27-32-4e.

ELLSWORTH COUNTY—Barnsdall et al, Warmhoff 1, se nw nw ne 26-16-10w. Skelly, Melchart 1, c nw nw sw, 6-17-9w.

GREENWOOD COUNTY — Theta Oil, Schneider 25, se sw nw 10-23-13e. Houston-Okla., Berry 1, center of 28-23-13e.

McPHERSON COUNTY—W. C. Snyder, A. Carlson 1, c se se se 4-19-3w. Mid-Kansas Kasey 1, c ne sw nw 35-19-3w. Gypsy Oil, Chris Stucky 2-C, c ne ne ne 33-20-3w. Slick-Pryor & Lockhart, Gratton 1, c ne nw ne 34-20-3w (owdd).

RENO COUNTY—Olson Oil, Sabin 1, c se ne 24-23-4w. Nat'l Union Oil, Hill 1, c ne ne se 18-24-4w.

WOODSON COUNTY—Nye et al, Schaffer 1, se se w, 31-23-14e.

Wildcat Drilling Report

(Wells shut down not included)

SUMNER COUNTY — Trees Oil Co. and Shell, Springate 1, ne se sw, 6-34-2e, sd 3639 ft.

SEDGWICK COUNTY—Standard of Kansas, Linot 1, c se sw, 8-28-2e, dr 3083 ft. Miller et al, Jones 1, sw c, 26-27-1e, dr 1334 ft.

BUTLER COUNTY—Ramsey et al, Michael 1, sw nw nw 18-27-3e, spd.

EDWARDS COUNTY—Mid-Kansas, Converse 1, sw ne ne, 30-24-18w, 10-inch 3135 ft, dr 3315 ft.

RENO COUNTY—National Union, Hill 1, ne se 18-24-4w, lcn.

FINNEY COUNTY — National Ref. Co., Wells 1, sw c, 13-23-30w, td 5080 ft, ur 6-inch.

RENO COUNTY—Jarvis & Wright, Rainbow 1, nw nw se, 33-22-7w, pb 3570 ft, shot 100 qts 3536-61 ft, D&A.

HARVEY COUNTY—D. R. Louck, Regier 1, sw se nw, 9-22-3w, td 2535 ft, ur 10-inch.

BARTON COUNTY — Midwest, Scheufler 29, c sw se, 9-20-11w, rig.

RICE COUNTY—Langston et al, Wells 1, ne se 4-20-9w, rig. Roy Ramsey, Hilton 1, sw ne sw, 6-20-9w, ru.

BARTON COUNTY—Skelton-Ott 1, c se se, 16-19-14w, sd 3600 ft, cas trbl.

McPHERSON COUNTY — Snyder et al, Carlson 1, se c, 4-19-3w, rig. Deitrick et al, Sinclair 1, se sw, 25-19-1w, BML 3145, Viola 3414, td 3415, SO&W, sd.

MARION COUNTY—Deitrick et al, Dalke 1, nw se, 11-19-1e, spd and sd.

RICE COUNTY—Slick et al, Orth 1, se se ne, 27-18-10w, dr 1300 ft.

McPHERSON COUNTY—Simmons-Canary, Krehbiel 1, 33-18-1w, td 1475 ft, rng 12-inch.

CHASE COUNTY—Ryan et al, Lipps 1, c se sw, 25-18-6e, dr 300 ft.

ELLSWORTH COUNTY—Slick et al, Dreford 1, sw nw, 7-17-10w, rig and tools.

McPHERSON COUNTY — Sidwell et al, Nichols 1, ne nw nw, 28-17-1w, rog.

ELLSWORTH COUNTY—Raymond Gear & Hannah, Kroboth 1, se nw, 12-15-10w, spd and sd. Johnson & Vickers, Claussen 1, c se nw, 31-15-10w, td 2300 ft, ur 10-inch.

DOUGLAS COUNTY — Hewitt & Lewis, Dodder 1, cnl sw, 7-15-18e, td 1335 ft, D&A.

GRAHAM COUNTY — Schleimeyer et al, Smith 1, se c, 24-8-25w, rig.

OSAGE COUNTY—Riggs-Smith, Wood 1, c se nw, 21-14-15e, td 2200 ft, temporarily abn.

SHERIDAN COUNTY — Flo et al, Shoemaker 1, se sw sw, 27-7-26w, co 4520 ft.

EAST CENTRAL TEXAS

East Texas Drilling Is to Get Weather Advantage. Failure Indicates South End of Big Pool.

H. H. KING, *Staff Representative, Fort Worth, Texas*

East Texas Drilling Nears Peak of October

Tyler, Texas.—Operating units in the East Texas field falling within the major company classification are maintaining a rate of drilling that is near the peak level for most of the companies. It is the intention of these companies, with few exceptions, to take a holiday on development work, next winter, and for this reason have advanced their drilling programs. Another factor is the desire to place as many of the contemplated well sites on production at the earliest date possible in order to cash in on the flowing life of the Woodbine horizon.

A survey of operations underway in the East Texas field reveals that the volume has steadily gained in recent months with the arrival of favorable weather and the passing of the flood stage of the Sabine River and its tributaries skirting the field. Total operations are crowding the peak level reached last October when the well allowable was 165 barrels daily, with a price of 68 cents per barrel prevailing. This compares with a current allowable production of only 54 barrels daily per well, with the oil bringing 98 cents per barrel.

Transportation, drilling and labor costs during the winter months and early spring rainy season are excessive in the East Texas field as compared to those prevailing in warm weather when the river and creek bottoms are free of flood waters, and the highways are passable to heavy trucking. Experience gained last winter and spring by the large companies has resulted in the adoption of a policy to greatly restrict all unnecessary field work when weather is adverse.

The accompanying table showing current field activities of the 15 most aggressive companies and operators reveals that this small portion of the total group in the field are accounting for considerable more than half of the development work.

New Well Added to North End of Van Pool

Tyler, Texas.—A large gas flow with oil was developed on the north end of the Van field by the completion of Pure Oil Company's L. M. Brawner 5, although it is a south offset to a small well. Brawner 5 cemented seven-inch pipe above sand at 2807 feet, and drilled to 2925 feet, resulting in an initial flow of 33 barrels of oil per hour, 11/16-inch choke, with 2,820,000 cubic feet of gas.

Humble Oil & Refining Company's J. F. McPherson 1, a north offset, was completed in April flowing only 15 barrels daily at 2959 feet.

Pure Oil Company is to venture out into virtually dry hole territory on the northwest edge of the Van field to drill V. T. Davis 2, 610 feet north and 200 feet west of the southwest corner of the J. E. Crim 43-acre lease but on 139.9-acre tract, M. Gross survey. This is a short distance east of Davis 1, which proved dry after establishing a new depth record for East Texas at 7501 feet last March.

Pure Oil Company's A. W. Ellison 4, Jas. Rose survey, and on the southwest edge of the field is to be completed as a pumper after failing to flow from broken Woodbine sand at 2881-2955 feet.

Atlantic Buys Part of Bennett Properties

Tyler, Texas.—Mills Bennett Production Company of Houston has sold its W. J. Brightwell 88-acre lease, R. W. Smith and R. E. Winn Surveys, Rusk County, Kilgore district of the East Texas field, with 10 producing wells on the property, to Atlantic Oil Producing Company. Consideration which was involved in the transaction was not revealed.

Mills Bennett Production Company acquired the properties in May, 1931, from Gulf Coast Oil Company (Moody-Seagraves interests). The Bennett interests still own four producing wells and 108 acres of proven leases in the East Texas field, the wells being on the Pinkston land in the Joiner area. The same interests also still own a large pipe line system which moves oil out of the field, operated as Liberty Pipe Line Company.

Wales Pipe Line to Purchase Kilgore Oil

Longview, Texas.—Wales Pipe Line Company has been organized by a group of independents to purchase, gather and market crude in the Kilgore section of the East Texas field, having taken a lease on the Houston Oil Company's six-inch system, extending from car rack, southwest of Kilgore, to the Sabine River, and also a 55,000-barrel steel tank. In addition to making tank car crude deliveries from the field, the above pipe line company has made arrangements to tender oil to Tyler Pipe Line Company, which in turn supplies the Tyler plant of Taylor Refining Company. Paxton Gray, J. G. Pundt and R. W. Porter are reported to be the principal owners of Wales Pipe Line Company.

Operations East Texas Field

Most active companies operating in Gregg, Rusk, Upshur and Smith Counties, comprising the East Texas oil field, are listed below, with total operations held by each:

Company—	Locations	Derricks & Rigs	Active Tests	Total Under way	Total Producers
Atlantic Oil Prod. Co. et al...	42	29	23	94	159
Humble Oil & Ref. Co.	7	27	24	58	619
Sun Oil Company	15	10	21	46	184
Sinclair Prairie Oil Co.....	5	10	29	44	299
Gulf Prod. Co. et al	7	8	28	43	373
Mid-Kansas Oil & Gas Co.....	12	13	10	35	80
Stanolind O&G Co. et al.....	10	9	11	30	160
Magnolia Pet. Co.	6	7	13	26	295
Tidal Oil Company	4	5	14	23	188
Shell Petroleum Corp.	5	6	7	18	183
Empire Gas & Fuel Co.....	8	7	3	18	61
The Texas Company	7	6	4	17	97
Arkansas Fuel Oil Co.....	..	9	5	14	109
H. L. Hunt et al	2	4	7	13	100
Yount-Lee Oil Co.	2	5	4	11	113
Golding-Murchison Oil Co....	1	2	2	5	46
Total for 16 companies.....133		157	205	495	3066
Miscellaneous companies 70		116	183	369	2741
Total 203		273	388	864	5807

Water Indicates End on South For Big East Texas Field

TYLER, JUNE 3.

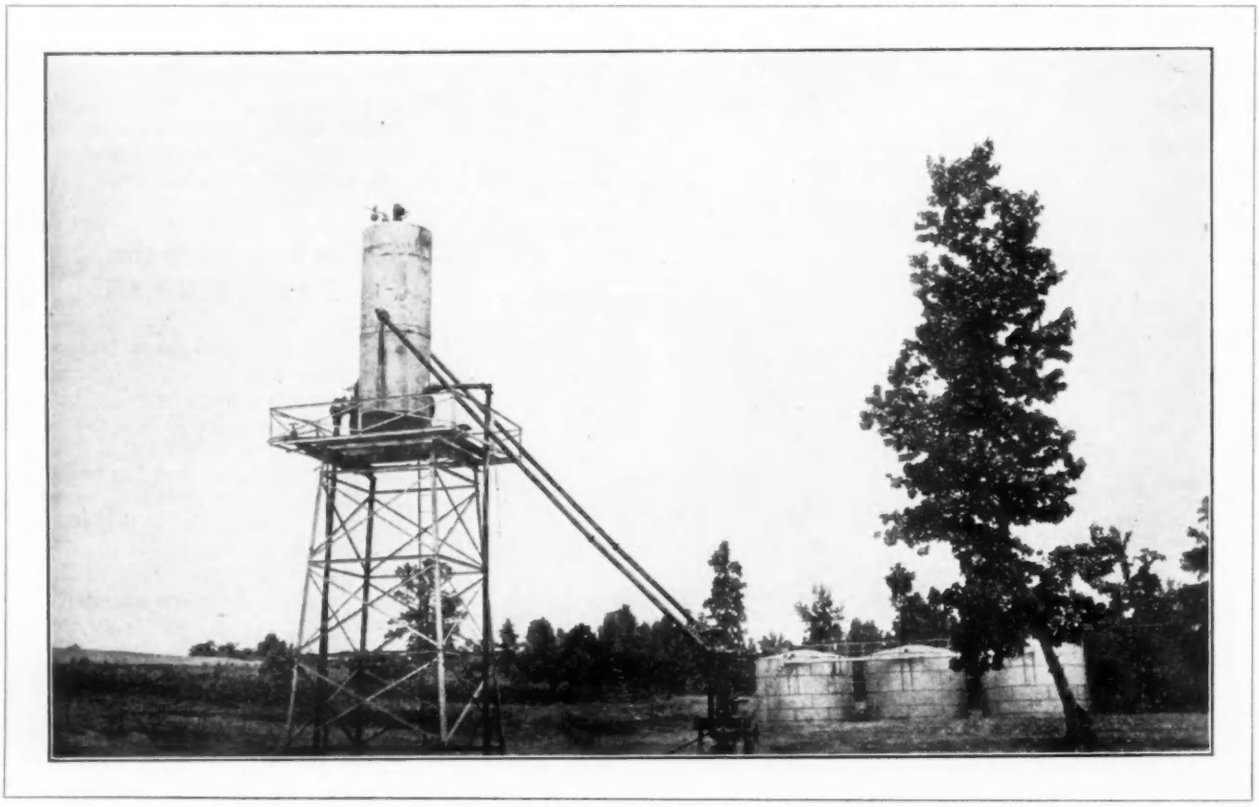
THE East Texas field's sweep to the south with gas production on the lower end was partially checked when the Marr Drilling Company's Tom Lacy-Pure 1, located in northwest corner of 50-acre lease, J. H. Sparks Survey, Rusk County, and 1½ miles southwest of a gasser, developed mostly salt water with a show oil and gas when tested in Woodbine sand at 3705 feet. This outpost test was drilled to a sub sea depth of 3328 feet. It will probably be abandoned without running casing to make a more thorough production test.

Appearance of salt water in the very heart of the widest section of the Joiner field, as reported last week, has been terminated by the sacrifice of 15 feet of Woodbine sand on the British-American Oil Producing Company's J. D. Stone 1, M. J. Pure Survey. This well was making four per cent salt water while restricted to its proration allowance from sand at 3708-30 feet, with a sub sea total depth of 3298 feet. A successful job was made in plugging back, and no harm was done to the offset wells during the brief period that water was produced from Stone 1. This water development has proven conclusively that water may break into the main part of the field with the aid of excessive oil and gas drainage on nearby acreage in advance of the flooding of the producing sand situated at a lower structural position on the water approach, or west side of the structure. A trio of wells in the Cordova Survey to the north proved such to be true several months ago on leases of the Gulf Production Company and East Texas Refining Company, although wells located to the west and much lower structurally have escaped water troubles. It is now quite evident that oil and gas drainage is going to have more bearing on water developments than the structural position of wells, with wells on the brink of the field naturally excepted from the rule.

Sun Oil Company's Ellen Till 1, located on 126-acre lease, Pena Survey, and an east offset to an outpost well on the southeast side of the Joiner area, missed being a pumper by a narrow margin, as its initial was placed at 14 barrels oil per hour through 2-inch tubing from broken sand at 3571-3617 feet. Till 2 is being drilled on the north end of the tract, as a west offset to W. H. Gant et al's L. A. Till 1, which failed to flow when drilled to 3658 feet. Another pumper was added to the east edge of the Joiner area when Anderson et al's E. B. Alford 1, located at center of block 3, I. G. Parker Survey, failed to flow when tested in broken sand at 3596-3742 feet, with hole bottomed in lime at 3743 feet, and pumped 15 barrels oil per hour on initial gauge.

Zion Oil Company's A. W. Barnett-Tidal 1, located on 24-acre, J. Taylor Survey, Gregg County, and on the west edge of the Kilgore area, failed to make a commercial producer when tested in sand at 3745-46 feet, or 3331 feet below sea level. It has been deepened six feet to a sub sea depth of 3337 feet without showing water, but at last reports was having difficulty in making a flowing well. Wells in this general area have been able to penetrate the sand to a greater sub sea depth than any other section along the west side without making water.

On the extreme north portion of the field, H. L. Allen et al's M. Bonner 1, located on 19-acre lease, Jas. McRae Survey, failed to flow when tested in the Woodbine sand horizon, and has



been shot, with prospects of making a commercial pumper.

The Trinity sand horizon is the intended goal of three wildcats scheduled for the east and west flanks of the East Texas field as if though the Woodbine sand is not capable of utilizing the full efforts of all companies and independents for years hence. Dodd & Markey's Holt 1, located on 40-acre lease, H. Edwards Survey, has made little progress on a Trinity sand test undertaken last January, but E. B. Whittington and associates have made location for C. O. Cunyas 1, located on 210-acre tract, Eleanor Bradley Survey, with the same objective. These two wildcats are located in southern Gregg County, and east of the field. Frank Russell and others plan to give the Trinity a try on the opposite side of the field, and are acquiring acreage with intentions of deepening F. Stone 1, which was abandoned last January as a failure in the Woodbine at 3795 feet. E. O. Butler of Durant, Oklahoma, and others have blocked about 1500 acres centering on the northwest corner of the J. Latham Survey, Rusk County, with the Trinity sand as the announced goal. This wildcat will be southeast of the field, and about 10 miles south of Henderson.

Upshur County

The Jamestown area, Southeastern Upshur County, is to receive a new test to the east of the small oil producer of Cranfill-Reynolds Company et al on the M. L. Rash tract as result of Maddox Development Company having acquired the Willie Starr 96-acre lease, Chas. Cooper Survey. A test will be started promptly on this tract. McFarland-Phillips Development Company et al drilled a hole to 3500 feet recently, but litigation developed and the lease expired before the test reached the Woodbine. In order to avoid a kickback from this litigation the above company is to drill a new hole.

Skimming Plant Will Use Denton County Crude Oil

Fort Worth, Texas.—Construction work has been started by Bruce Young, John C. Schroeder and associates of Grandfield, Oklahoma, on a 500-barrel capacity skimming plant at Pilot Point, Texas, to operate on low gravity crude produced in a shallow pool near the above town in Denton County. Danciger Oil & Refining Company is the principal producer. Young was formerly with the Bell Oil & Gas Company.

Central East Texas Field Developments

Completions

Company, Well and Location—	Initial Production Bbls.	Depth
JOINER AREA—		
Anderson et al, E. B. Alford 1	400	3743
Bussa Oil Co., Inc., W. P. Brett (10-ac) 3	3500	3760
Cullen Oil Co., A. Thrash (9-ac) 2	8200	3741
DeMontrond Oil Corp., F. L. Pinkston (24.2-ac) 2	7500	3627
Devonian Oil Co.-Barnsdall Oil Co., W. O. Alford (99.35-ac) 6	8000	3773
R. W. Fair-Thompson, E. B. Alford (4-ac) 1	1500	3630
Federated Oil Co., Mayfield-Alford (16-ac) 4	200	3676
Great Plains O&G Co., S. Stone (27-ac) 4	9000	3687
Gulf Prod. Co., L. P. Thrash (76-ac) 4	7200	3700
H. E. Hale et al, S. M. Clay (75-ac) 2	2000	3680
Hal Houghton et al, W. E. Wylie (10-ac) 1	2000	3676
Humble O&R Co., J. H. Arnold (20-ac) 6	8200	3807
Odell Blackwell (74.4-ac) 5	7500	3709
H. A. Piercy (90.66-ac) 5-A	7400	3741
J. W. Turner (104½-ac) 9	7400	3811
C. W. Wilson (58.61) 3	7000	3701
Clayton Young (33-ac) 1	9600	3685
H. L. Hunt et al, Sue Hale (91-ac) 2	750	3711
Joe Lee (56.4-ac) 2-C	9400	3748
Iowa Payne Oil Co., J. B. Wilson (25-ac) 2	8500	3761
E. W. & F. D. Jones, W. P. Moore (33-ac) 3	7000	3646
Kenwood Oil Co. (was Geo. L. Pace), A. J. Deason (20-ac) 3	6500	3795
Lion Oil Ref. Co., Wm. Jobe (20-ac) 3	7000	3705
J. E. Mabee, Inc., S. Stone (18-ac) 2	10,000	3633
Mid-Kansas O&G Co., Henry Clay (130-ac) 1	1500	3733
C. L. Graham (134-ac) 5	8000	3647
J. F. Mason (116-ac) 7	6000	3711
J. M. Price (55-ac) 3	7000	3699
M. L. Thompson (100-ac) 8	7200	3637
Sinclair Prairie Oil Co., W. T. Grissom (47-ac) 2	7200	3687
W. D. Kinney (579-ac) 27	8500	3657
E. E. Moore (103-ac) 2	3000	3759
G. Patterson (153-ac) 4	5000	3716
Amanda Wiley (312-ac) 6	11,000	3793
J. B. "Bunch" Wilson 65.84-ac) 3	6500	3767
Stanolind O&G Co., R. G. Mason (100-ac) 3	7200	3619
Stanolind-Pure Oil Co., R. J. Burton (144¾-ac) 3	8500	3615
R. A. Moores (251.6-ac) 6	7000	3603
W. H. Siler (949.6-ac) 3	9600	3629
Summit Drl. Co. (I. P. O'Neil), Mayfield-Shell (200-ac) 5	2500	3846
Sun Oil Co., J. J. Denton (37-ac) 1-B	5000	3731
Ellen Till (126-ac) 1	1000	3617
The Texas Co., A. S. Jarvis (81-ac) 5-A	6500	3652
J. M. Price (90-ac) 5	5000	3610
Ward Oil Corp. et al, J. M. Finney (43½-ac) 6	6000	3690
KILGORE AREA—		
Adams & Lyles, L. Howard (49-ac) 1-A	13,000	3640
Atlantic Oil Prod. Co., Clayton (267-ac) 4	10,000	3557
Bay Oil Corp. (Oliphant et al), W. P. Moore-Shell (98-ac) 4	8000	3804
Byrd-Frost, Inc., Atlantic Oil Prod. Co., Hughey 7	9600	3595
Cordova Union Oil Corp. et al, C. O. Christian (36.65-ac) 2	11,000	3691
Cranfill-Reynolds Co., R. L. Martin (40-ac) 2	8500	3634
East Texas Ref. Co., C. Webb (14-ac) 2	6500	3675
D. Wills (80-ac) 8	12,000	3659
Empire Gas & Fuel Co., Lockhart 3	11,000	3574
E. L. Walker (160-ac) 2	10,000	3576
Everts Drl. Co., O. Cook (17-ac) 1	7500	3656
Griffin 1	250	3585
Friedman Oil Corp., Mayfield 123-ac) 2	7000	3702
Gulf Prod. Co., C. Brown (60-ac) 5	9000	3505
C. E. Christian (277.65-ac) 13-C	8500	3753
M. T. Cole (160-ac) 8	8600	3546
G. W. Culver (244-ac) 9	5500	3539
S. Hilburn 22	10,000	3587
W. Holt 10	9600	3608
Harcher Oil Co. (was Vance-Fagan) L. Alexander (¼-ac) 1	12,000	3586
Humble O&R Co., L. D. Crim (628-ac) 53	9000	3726
L. D. Crim (628-ac) 54	11,000	3647
Koberg Oil Co., L. Martin-Atlantic (25-ac) 1	8000	3676
Kniveton Oil Co., W. P. Crews (48-ac) 1	11,000	3712
Louisiana Oil Ref. Corp., Wm. Jernigan (110-ac) 6	7200	3645
Magnolia Pet. Co., L. A. Griffin (44.6-ac) 9	9000	3590
Laird-Crim (71-ac) 1	13,000	3586
W. M. Jernigan (110-ac) 3	15,000	3661
John Owens et al, Cole 1	7200	3545
Republic Prod. Co., Wm. Clayton (60-ac) 5	8000	3581
Shasta Oil Co., Hugh Alexander (25-ac) 2	6500	3681
Shell Pet. Corp., B. F. Laird (206-ac) 4	12,000	3578
M. H. Bivins (120-ac) 4-B	9000	3636
H. T. Neal (41-ac) 4	15,000	3584
Sinclair Prairie Oil Co., M. T. Cole (666-ac) 20	3000	3568
M. T. Cole (666-ac) 22	7000	3667
M. T. Cole (666-ac) 24	4500	3594
A. A. King (290-ac) 16-A	10,000	3495
A. A. King (290-ac) 17-A	10,500	3488
A. A. King (290-ac) 18-A	10,000	3495
A. A. King (337-ac) 14-B, tract No. 1	11,000	3480
A. A. King (337-ac) 15-B, tract No. 1	12,000	3490
A. A. King (337-ac) 16-B, tract No. 1	9600	3500
A. A. King (147-ac) 3-B, tract No. 5	8500	3456
J. E. Lawther (317-ac) 4	7500	3548
A. A. Lockhart (87-ac) 5	5200	3685
A. A. Lockhart (87-ac) 6	8600	3636
Standard Oil Co. of Kansas (was Tulsa Oil Co.) J. A. Knowles (22-ac) 1	10,000	3626
Sun Oil Co., M. T. Cole (64-ac) 6	13,000	3560
J. S. Elder (75-ac) 3	11,000	3566
Wm. Pentecost (131-ac) 4	12,000	3645
The Texas Co., M. T. Cole (220-ac) 5	7500	3560
Tidal Oil Co., W. D. Lacy (80-ac) 5	6000	3550

ABBREVIATIONS

NOTE—The following is the explanation of abbreviations, signs, etc., used in completion and wildcat reports: *—dry hole, abandoned well; ‡—salt water; †—junked and abandoned; ¶—million feet of gas; abn—abandoned; bbls—barrels; b.s—basic sediment; cas—casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in.—inches; lcn—location; m—milling; n s, e, w—north, south, east, west; r—reaming; sd—shut down; sdtr—sidetracking; sp—spudding; sr—straight reaming, std—standardizing; sw—salt water; td—total depth; ur—underreaming; wo—workover; wosr—waiting on standard rig.

Company, Well and Location—	Initial Production Bbls.	Depth
Weaver-Crim Corp., Ben Laird 6	9600	3600
LONGVIEW AREA—		
Alma Pet. Corp., J. W. L. Younse (86-ac) 3	9200	3673
Amerada Pet. Corp., E. Burnside (100-ac) 3	10,000	3556
Continental Nat'l Bank (102.3-ac) 5	8000	3595
Allen Tooke (60-ac) 5	8800	3522
Arkansas Fuel Oil Co., W. T. Burnside (209-ac) 1	13,000	3515
Atlantic Oil Prod. Co., M. Fisher (65-ac) 5	9000	3499
Allen Tooke (40-ac) 2-A	8500	3582
Atlantic-Sun Oil Co., R. C. Barnswell (100-ac) 1-C	9600	3501
M. Hays (448-ac) 6	11,000	3565
Barnsdall Oil Co.-Sun Oil Co., G. W. Bingham (100-ac) 7	7800	3553
J. G. Beard et al, J. M. Farrell (43-ac) 3	6000	3628
Big Indian O&G Co., W. R. Nicholson (26½-ac) 2	6500	3686
Bridwell Oil Co., O. Leckett (27-ac) 2	13,000	3669
California Pet. Corp., Mrs. I. Walker (120-ac) 6	8200	3658
Coastal Drl. Co., J. H. Alexander (20-ac) 2	7000	3570
Columbia O&G Co., A. Christian (17-ac) 2	12,000	3636
Danciger O&R Co., G. S. Mattox (39-ac) 2	7200	3610
T. B. Stinchcomb (84-ac) 3	6500	3755
Deep Rock Oil Co., H. Pritchard (105-ac) 5	15,000	3564
Mrs. F. Dodson et al, A. V. Bacle 1	9600	3656
East Texas Loan & Inv. Co., Geo. Anderson (12-ac) 2	10,500	3540
East Texas Ref. Co., S. Doby Rodden (40-ac) 3	7200	3724
Harry Edwards Drl. Co., J. W. Starr (12½-ac) 2	7500	3625
Empire Gas & Fuel Co., J. C. Bumpas (68-ac) 5	10,000	3545
J. T. Jeter 2	10,500	3615
L. A. Jeter (121-ac) 9	9600	3576
T. W. Lee 3	8000	3564
Fain-McGaha Oil Corp., R. Corbin (40-ac) 2	15,000	3585
F-H-E Oil Co., J. E. Christian (33½-ac) 5	11,000	3628
J. E. Christian (33½-ac) 6	8800	3640
Gulf Prod. Co., J. H. Bozeman (111-ac) 5	9000	3606
S. C. Fishburn (200-ac) 10	9000	3508
F. M. Fonville (100-ac) 4	8500	3529
Hamill Drl. Co. & Smith, Everett 1-A	8500	3521
P. L. Hoffman et al, B. F. Phillips (16½-ac) 2	11,500	3672
Howard Pet. Corp., A. Davis (47-ac) 4	14,000	3591
Humble O&R Co., J. K. Edwards (200-ac) 17	7000	3663
W. R. Hughes (185-ac) 9	8500	3634
M. Killingsworth (77-ac) 6	8700	3648
May Mattox (61¼-ac) 2	9200	3686
Eve O'Byrne (125-ac) 3-B	9000	3664
A. L. Shelton (29.8-ac) 2	7500	3704
A. J. Watkins (76½-ac) 3	9600	3687
B. K. Isaacs-Virginia O&R Co., T. B. Harris (60-ac) 2	9000	3522
Jackson-Wise & Snedden, R. Corbin (40-ac) 3	7200	3638
Kewanee O&G Co., Fee (was T&P) (168-ac) 11	15,000	3568
Magnolia Pet. Co., N. W. Blackwell (90-ac) 5	10,000	3692
W. E. Jones (99.92-ac) 6	11,000	3685
J. A. Parnell (40-ac) 4	9000	3565
Mansion Oil Co., T. A. Webb (34-ac) 4	10,000	3718
Meridian Pet. Corp., T. W. Lee (53-ac) 4	14,000	3642
Midas Oil Co., A. V. Bacle (7.3-ac) 4	10,000	3615
Mudge Oil Co., J. W. Free (113-ac) 7-A	8000	3681
Pilot Oil Co., T. B. Harris (91.54-ac) 4	13,000	3528
Rancho Oil Co., J. K. Edwards (106-ac) 6	7500	3656
J. K. Edwards (106-ac) 7	7000	3646
Roeser-Pendleton, Inc., J. R. Fenton (17-ac) 2	10,000	3633
W. R. Nicholson (75-ac) 1-B	9500	3614
Selby O&G Co., Snavely (321-ac) 4-B	9500	3585
Snavely (106-ac) 5-D	9000	3590
Shano Oil Co., Doby-Rodden (43-ac) 4	12,000	3762
Shell Pet. Corp., R. L. Bassham (56-ac) 4	11,000	3664
Silver Star Oil Co., Geo. Abderson-Thomas (8-ac) 2	8500	3531
Sinclair Prairie Oil Co., J. W. Akin (100-ac) 6-A	14,000	3598
I. Isley (100-ac) 7	9000	3560
J. R. Williams (82-ac) 6	15,000	3535
Stanolind O&G Co., M. B. Harley (41-ac) 3-C	11,000	3664
Stanolind-Simms Oil Co., J. J. Flewellen (374-ac) 10-B	6500	3680
A. J. Tuttle (95-ac) 5	8000	3530
Stanolind-Simms-Peachblossom Oil Co., J. W. Akin (80-ac) 2	9000	3619
Stroube & Stroube, Anderson-Harris 1	10,000	3540
Sun Oil Co., W. L. Fuller (50-ac) 2	4000	3710
Superior Oil Co., A. Jones (64-ac) 7	13,000	3653
H. Pritchard (100-ac) 5-A	15,000	3563
Texnia Oil Co. (was Peckham), J. W. Free (28-ac) 2	11,000	3657
Tidal Oil Co., J. J. Castleberry (202-ac) 11	6500	3596
W. E. Jones (80-ac) 6	9000	3660
Ty-Tex Oil & Dev. Co., Jones 1	*	3657
W. N. Wages et al, Finley-Thomas 1	*	3200
H. E. Williams et al, Brawley 1	11,000	3514
Woodley Pet. Co., T. B. Harris (30-ac) 3	12,000	3575
J. A. Woods et al, J. H. Sheppard (54-ac) 2	10,500	3609
Yount-Lee Oil Co., A. A. Castleberry 2	6500	3628
J. C. McKinley (63-ac) 3-A	9000	3565
T. M. Whatley (51-ac) 3-A	9000	3531
VAN FIELD—		
Pure Oil Co., L. M. Brawner (148.3-ac) 5	45 and 3000	2925
A. W. Ellison (67-ac) 4	60	2955

CENTRAL EAST TEXAS Completions

Company, Well and Location—	Initial Production Bbls.	Depth
Completions		
RUSK COUNTY—		
G. H. Vaughn et al, L. T. Burton 1-A	*	3309
UPSHUR COUNTY—		
McFarland-Phillips Dev. Co., Willie Starr (96-ac) 1	*	3522

Wildcat Drilling Report

(Wells shut down not included)

ANDERSON COUNTY—Roeser-Pendleton, Inc., et al's M. A. Davey 1, P. G. Adams sur, dk.

CASS COUNTY—Lapan-Lovejoy et al's S. A. Orr (320-ac) 1, G. W. Morris sur, dk.

BOWIE COUNTY—Joe M. Burnham-Robinson & Greer's F. O. Weiss (949-ac) 1, J. Dean sur, dr lime 2935 ft. Lee J. Timberlake et al's C. E. McElwee (60-ac) 1, Martha Poor sur dr shale 1725 ft.

CHEROKEE COUNTY—Mustang Oil Co. et al's B. Decker (75-ac) 1, G. T. W. Fulgham sur, elev 457 or 341 ft, top Midway 2880 or 2956 ft, Pecan chalk 4066-4441 ft, top Austin chalk 4932 ft, tested salt water in Woodbine 5202 ft. Bridges-Chandler's Berryman 1, H. Kimble-Dill sur, dr in shale 1560 ft. Wm. A. Stone et al's Mrs. J. I. Perkins (200-ac) 1, Thos. Stanford sur, sp and sd. Wilson-Stubbs Oil Corp.'s M. Ragsdale (53-ac) 1-A, J. D. Wolfin sur, rig.

DELTA COUNTY—C. M. Joiner Pet. Corp. et al's J. A. Blackwell 1, H. Dunnetella sur, dr shale 2140 ft. J. O. Wheeler-Neuville-Yarbo et al (was Commercial Oil & Dev. Co.'s) Ablovich 1, E. Chick sur, dr Eagleford shale 3735 ft.

ELLIS COUNTY—Armstrong Bros. et al's J. T. Winn 1, E. Melton sur, sd 1435 ft. Cook (56-ac) 1, S. Frederick sur, dr 315 ft. Worthen Pet. Co.'s M. Cerf 1-A, John Harris sur, trace oil 1641-45 ft, dr 1840 ft. Carl Brooks et al's Anderson (3900-ac) 1, E. C. Branch sur, lcn.

FRANKLIN COUNTY—J. F. Mills-McGee & Harper's L. S. Harper (118-ac) 1, W. N. Dawson sur, coring sandy shale 3210 ft. T. E. Mayberry et al's M. L. Edwards 1, G. A. Miller sur, dk.

HENDERSON COUNTY—B. L. Green (was J. M. Roger's) M. H. Gossett (103-ac) 1, Stover sur sd 1030 ft.

LAMAR COUNTY—Doyle & Jondreau's L. Martin (132-ac) 1, Joseph Deck sur, sd 2445 ft; Joe Horn (178-ac) 1, R. P. Mayo sur, dr sandy lime 2815 ft.

LIMESTONE COUNTY—C. M. Joiner-Miller Drilling Co.'s No. 1, Geo. Gentry sur, dk.

LEON COUNTY—Leon County Oil Co. (Claude Kavanaugh's) John Morris (200-ac) 1-A, A. F. McWhorter sur, dr shale 1790 ft.

MORRIS COUNTY—Buchanan & Burkhalter's Staggers (65-ac) 1, Forbes & Nelson sur, elev 370 ft, hard pecan chalk 2526-3020 ft, base broken Pecan 3095 ft, Austin chalk 3483-3506 ft, cem 6⅝ cas at 3506 ft, cored shale 3520-38 ft, with no trace oil or gas, sd orders. J. E. Crosbie, Inc. (was J. W. Olvey et al's) S. Sibley (25-ac) 1, W. O. Mathews sur, elev 334 ft, top Pecan chalk 2449-2995 ft, sd repairs 3535 ft. Merrill et al's Walcott 1, D. A. Russell sur, sd 400 ft.

RED RIVER COUNTY—L. G. Priest's G. W. Ware (1016-ac) 1, J. Burkham sur, dk.

RUSK COUNTY—Byrd & Frost, Inc.'s Buckner (49-ac) 1-A, J. E. Peyton sur, skid dk fr jkd hole at 4077 ft. E. O. Butler et al's R. H. Gay 1, J. Latham sur (Trinity sand test), dk. Marr Drl. Co.'s Tom Lacy-Pure (50-ac) 1, J. H. Sparks sur, elev 377 ft, tested show oil and gas with water at 3705 ft. Graddy H. Vaughn-Kelsey & Ross-Seward's L. T. Burton (125-ac) 1-A, P. J. Ybarbo sur, Pecan chalk 2420-2750 ft, dry and abn in Georgetown lime 3309 ft. Watson-Butler & Clark's G. W. Tips (94-ac) 1, Henry M. Smith sur, cem cas 250 ft.

UPSHUR COUNTY—Manus & Snuggs et al's J. N. Pool 1, S. J. Pound sur, (Kelsey Dome), sd 245 ft. Maddox Development Co.'s Willie Starr (96-ac) 1, Chas. Cooper sur, rig.

WOOD COUNTY—Wood County O&G Co. (Lee Culberson's) Guy Davis 1, John R. Clute sur, dk. Talko Pet. Corp.'s C. S. Ross (86-ac) 1, F. L. Smith sur, top Pecan chalk 2892 ft sd in chalk 3020 ft.

EAST TEXAS BORDER COUNTIES Completions

Company, Well and Location—	Initial Production Bbls.	Depth
MARION COUNTY—		
H. M. Harrold (formerly carried Howard), Hussey 1, Chas. Lockhart sur	†	600

Wildcat Drilling Report

(Wells shut down not included)

HARRISON COUNTY — Ryan Cons. Pet. Corp., J. M. Furrh 1, F. O'Neal sur, dk. Triangle Drilling Co., Platt 1, F. C. Baker sur, (320 ac), lcn.

MARION COUNTY—M. E. Nash et al, Henderson 1, G. L. Bledsoe sur (320-ac), 10-inch 86 ft wo cement. H. M. Harrold (formerly carried H. M. Howard), Hussey 1, Chas. Lockhart sur, 5⅜ cas 40 ft, junked abn, td 600 ft.

SHELBY COUNTY — General Minerals Corp., Pickering 2, D. S. Haight sur, sd 2580 ft. K. H. Francis, Jno. Mims 1, Mary Smith sur, rig up for second hole. Sedberry et al, Pickering 1, Jane Stoddard sur, claim oil and gas show in sand 1548-72 ft, cemtd 8-inch cas 1540 ft, td 1572 ft. Wray & Dunbar, Hayden 1, D. T. F. Yordt sur, claim gas show, failed to get core, wo, td 1583 ft. Maulding et al, Frost Lbr. 1, A. B. Fountain sur, rig up for second hole. Ridgeway et al, Polley 1, Domingo Gonzales sur, top Zwolle marl 1928 ft, cemtd 8-inch cas 1937 ft, td 1949 ft. Western World Pub. Co., Foster & Billingsley 1, J. Nowlin sur, sd 2940 ft lime.

NORTH and WEST TEXAS

Chalk Hill Deeper Sand Drawing Attention Fuel Assured for Test In Crockett County

H. H. KING, *Staff Representative, Fort Worth, Texas*

Two Extensions Will Bring More Drilling in Archer County Pool

Wichita Falls, Texas. — The Chalk Hill deep pay area in west central Archer County has strengthened its position of being the foremost flush area in North Texas since completion of an important extension to the northwest, with favorable chances for the Canyon formation to be extended about 2000 feet south. These two extensions will lead to competitive drilling which has heretofore not prevailed because of the eight flowing wells in the 2200-foot Canyon series, and a producer in the 3600-foot Strawn formation having been drilled jointly by Deep Oil Development Company and the Lindsay Drilling Company.

Completion of Deep Oil Development Company and Lindsay Drilling Company's L. F. Wilson 1, lease 5, located in the southwest corner of lot No. 2, Section 75, A. T. N. C. L. Survey, flowing 250 barrels initial via casing from sand in the Canyon lime series at 2238-2244 feet, affords a 3000-foot extension to the northwest. Sun Oil Company contributed this lease to the original discovery block for an over-riding royalty interest. This outpost well carried production to the edge of the original drilling block, and has resulted in L. T. "Bobby" Burns and C. B. Long starting a southwest offset on the Wilson-McCrory 41-acre tract subleased by Gulf Production Company. Burns et al are also rigging up rotary to drill a west offset to the above extension producer.

Falls Refining Company et al's L. F. Wilson 1, located 330 feet out of the northeast corner of lot No. 3, Section 119, has made a bid for a 2000-foot extension to the south, but has been delayed in completion because of a parted string of casing. It showed oil in sandy-lime at 2187-95 feet, followed by oil saturated sand at 2204-06 feet, then six feet of dry sandy-shale was cored to 2212 feet. The hole is bottomed in sandy-shale and lime at 2215 feet.

Approximately 200,000 barrels of 42 gravity oil has come from the nine completed wells in the 2200-foot sand since discovery in March, 1931, although rigid proration restrictions have been applied. These wells are now allowed to produce 20 per cent of the potential flow that is in excess of the 20 barrel marginal allowance. The oil is run by Gulf Pipe Line Company.

A long flowing life for wells in the 2200-foot horizon is indicated by the fact that the rock pressure averages 800 pounds, and this is an unusual reservoir pressure for such a comparatively shallow depth in the district. According to Harry Hines, vice-president and general manager of the Deep Oil Development Company, the oil production from the Canyon is coming from a sand body in the lime series, and coring has revealed the presence of as much as 24 feet of richly saturated oil sand. It has not been necessary to shoot or agitate wells to obtain flowing production.

An attractive location for a natural gasoline plant is in the making as development work expands, as the gas accompanying the restricted oil flow will yield an average of 2½ gallons of sweet gasoline per 1000 cubic feet of gas. Proration enforcement has held down the gas flow to such a small volume that a plant could not be operated profitably, but a substantial increase in the number of wells will probably afford an adequate supply for a small unit in the near future.

While the 2200-foot Canyon horizon is now the chief objective of "deep" development work at Chalk Hill and surrounding territory, the Strawn also has possibilities. This is borne out by the development of a 100 barrel pumper at 3614-40 feet by Deep Oil Development Company and Lindsay Drilling Company's L. F. Wilson 1, lease 5-A, a west offset to the discovery well of the Canyon zone. The latter was drilled to 5750 feet in accordance with a lease obligation, then plugged back for a successful completion in the deepest zone in the county.

North and West Texas Field Developments

Completions

NORTH TEXAS

Company, Well and Location—	Initial Production Bbls.	Depth
ARCHER COUNTY—		
M. M. Bradley et al, Garvey 1	*	1057
L. T. Burns et al, Carter 1	*	1507
Fain-McGaha Oil Corp., E. R. Fain 1	200	1797
E. R. Fain 2	200	1789
J. L. Jackson 1	125	1792
King Royalty Co., Wilson 1	*	1504
Moran Drlg. Co., Harmel 5	15	1433
Nix & Alexander, Wilson 1-B	*	1365
Perkins & Cullum, Titkin-Falls County 10	160	1147
Petroleum Producers Co., C. L. Abercrombie 1-A	*	1371
FOARD COUNTY—		
Hammock (was Harris & Co.) et al, Middlebrook 1	*	1280
WICHITA COUNTY—		
L. T. Burns et al, Waggoner 9	*	830
R. R. Clark et al, Munger 3	15	1046
Petroleum Producers Co., Chilson 1	*	1915
YOUNG COUNTY—		
Alexander et al, Lowe 1, Sec. 1921	*	600
Henry Dyer et al, J. A. Allen 1	240	2243
N. D. Goldsmith et al, Wilson 1, Sec. 162	140	996
Iron Mountain Oil Co., McBrayer 1, Sec. 1907	*	700
Tatum 6, Sec. 1908	60	666
Tatum 7, Sec. 1908	40	667
W. Newt Maer et al, McClatchey 1, Sec. 1476	*	915
John L. McMeans et al, Hawkins 2, Sec. 1917	*	560
E. C. Reed et al, Slayton 1, Sec. 3401	*	833
Seitz & Co., Ellis 2, Sec. 259	*	598
Underwood Drlg. Co., Eichelberger 1, Sec. 1471	*	852
F. E. Webb et al, Robinson 1, Sec. 1466	*	762

CENTRAL WEST TEXAS

Company, Well and Location—	Initial Production Bbls.	Depth
BROWN COUNTY—		
Beadie et al, J. D. Caldwell 3	*	614
Shead et al, Reeves 1	*	1324
Winters & Johnson, A. A. Martin 1	*	1495
CALLAHAN COUNTY—		
E. P. Frazier et al, Jackson 1	95	914
Guffey & Perry, W. E. Kennard 1	*	1488
Hoffman & Page Co., O. E. Radford 1	*	419
Pruitt & Van Deamon, Berry Bros. 1	*	453
L. R. Terry et al, F. E. Clark 1	*	807
COLEMAN COUNTY—		
Hayeck Oil Co., T. Stevens 1	*	687
EASTLAND COUNTY—		
Texas Pacific Coal & Oil Co., Fee 6	120	3096
PALO PINTO COUNTY—		
Linderman Bros. et al, Johnston 1	*	2835
SHACKELFORD COUNTY—		
Callahan & Gist, Sedwick 1	*	560
Clay Dome Oil Co., E. A. Jeter 2-A	¶1	932
Gilman & McMurray, Jeter 3	30	852
J. R. Hearley et al, Williams 1-B	3	755
A. C. Walker et al, L. H. Hill 6	20	961
THROCKMORTON COUNTY—		
Toucan Oil Co., Callahan 1	*	440
Callahan 2	*	400

WEST TEXAS

Company, Well and Location—	Initial Production Bbls.	Depth
CROCKETT COUNTY—		
Stanolind O&G Co.-Mid-Kansas O. & G. Co., Robt. Massie 1	¶18	1273
PECOS COUNTY—		
Cardinal Oil Co., Tippett 2-G	*	415
TAYLOR COUNTY—		
J. B. Dunigan-Eastland Oil Co., M. G. King 1	*	2513

Fuel Supply Assures Deep Test in Crockett County

San Angelo, Texas.—An adequate supply of natural gas to provide fuel in drilling the proposed 8000-foot Ordovician lime test on a unitized block of about 4000 acres in Crockett County was had May 30 when Stanolind Oil & Gas Company and Mid-Kansas Oil & Gas Company's wildcat on the Robt. Massie ranch measured 18,000,000 cubic feet daily in lime at 1271-1273 feet. In addition to supplying fuel for the scheduled deep test to be located about 1½ miles to the west, this shallow well was also intended to validate lease on about 3000 acres of nearby land that had been topped leased by Superior Oil Company of California. The latter's top lease would have become effective late this month. The Massie gasser is located 1980 feet from the east and 660 feet from the south lines Section 47, block "U-V", G. C. & S. Ry Survey, and about 12 miles southeast of the World-Powell field. The gas well recorded 435 pounds rock pressure when closed in.

Staking of location for the Crockett County unit test, which will be drilled by Stanolind Oil & Gas Company, major unit owner, is expected to be announced within a few weeks. It has tentatively been allocated to Section 66 or 67, block "U-V", with the latter now favored because of mineral lease being of shorter duration. The actual drilling of the wildcat to the Ordovician lime, which has been proven a very attractive oil and gas source at Big Lake, will be by contract.

This Crockett County unitized deep test has been the basis for intense trading in leases and royalties, and approximately $300,000 cash has been expended within the past nine months in the area, with major companies putting up most of the money. Another $150,000 or more is yet to be expended in drilling the test.

Texaco Will "Try Again" With Belcher 2 at Manvel

Houston.—The Texas Company evidently has given up the idea of trying for deeper production in Belcher 2 at Manvel field, Brazoria County, for after drilling the well to 6056 feet, after two previous unsatisfactory completions at 5602 feet and 5685 feet, respectively, it was plugged back this week to 5575 feet.

A drill stem test 5572 feet, made in February, showed 1500 pounds of pressure in 2¼ minutes. A small amount of oil was found in the last joint of the stem. At 5588 feet Belcher 2 cored a sand with hard streaks showing oil. But when formation from 5588 to 5602 feet was used in attempt to make a well, only 43 barrels initial resulted, although a pressure of 1750 pounds was gauged on the quarter inch choke.

Belcher 3, which will mark an attempted northwesterly extension of the producing area at Manvel, limited thus far to one oil well, still is a location.

Permits for Texas Wells

ARCHER COUNTY—R. N. Hamilton, Wichita Falls, G. R. Decker, 40, 1, Blk 5, GE&L sur, 150 ft from n and 300 ft from e line. Anderson-Daubert, Olney, C. L. Abercrombie, 34, 2, S 157, Club Ranch sur, 1225 ft from s and 1873 ft from w line. Fain-McGaha Oil Corp., Wichita Falls, E. R. Fain, 80, 1, B 25, DCSL sur No. 4, 150 ft from s and w lines of E½; 2, 150 ft from s and e lines of E½. M. Thomas, Wichita Falls, F. Pruitt, 140, 1, M. W. Shaw sur, 957 ft from s and 1782 ft from e line. F. Newson, Wichita Falls, J. T. Richardson, 20, 1, S 11, B 11, BBB&C sur, 150 ft from s and w lines. Wichita Oil Corp., Tulsa, Okla., H. S. Morrison, 80, 19, Blk. 6, DCSL sur, 1132 ft from s and 800 ft from e line. L. T. Burns, Wichita Falls, L. M. McCrory, 120, 4R, B 108, Amer. Trib. sur, 550 ft from s and 2400 ft from w line. C. B. Bailey et al, Wichita Falls, W. R. Brown, 20, 2, B 106, Amer. Trib. sur, 150 ft from w and 450 ft from n line. H. Z. Kouri, Wichita Falls, J. P. Montgomery, 50, 1, B 133, Club Ranch sur, 2290 ft from n and 330 ft from w line.

BROWN COUNTY—B. D. Dozier, Brownwood, J. C. Jones, 338, 2, Kereober sur, 2805 ft from e and 1060 ft from s line. J. P. Nystal, Abernathy, C. T. Moore, 57, 1, B 13, KCSL sur, 750 ft from n and 450 ft from w line. French & Simons, Brownwood, H. J. Marr, 90, 1, S 62, N. P. Tuggle sur, 150 ft from s and e lines. H. P. Evans, Brownwood, J. C. Martin, 52, 1, S 11, H&TB sur, 350 ft from n and 150 ft from w line.

BORDEN COUNTY — Westyde Inv. Co., Fort Worth, R. H. Looney, 1, S 15, B 33, T&P sur, 990 ft from s and e lines.

BROOKS COUNTY—Allen & Morris, Laredo, Holbein, 962, 2, E. P. B. Marquelles sur, 7525 ft from e and 450 ft from n line.

CALLAHAN COUNTY—Shaheen Oil Co., Abilene, O. A. Hutchinson, 100, 1, S 135, BBB &C sur, 150 ft from s and 175 ft from w line. Woodley Pet. Co., Shreveport, La., E. L. Finley, 618, 8D, S 73, Bayland Asy. sur, 1320 ft n of No. 7D. C. B. Holmes, Baird, M. Hadley, 160, 1, S 146, BBB&C sur, 2180 ft from n and 1170 ft from e line. Woodley Pet. Co., Shreveport, La., E. L. Finley, 618, 9D, S 73, Bayland Asy. sur, 600 ft from n and 1300 ft from w line. H. P. Kellar, Cross Plains, A. B. Hargrove, 160, 1, No. 2, Blk. 5, S. P. Ry. sur, 920 ft from w and 1140 ft from s line.

CARSON COUNTY—Skelly Oil Co., Tulsa, Okla., H. Schafer, 640, 18, S 87, B 3, I&GN sur, 1389 ft from e and 430 ft from s line.

COOKE COUNTY — L. Hedrick, Wichita Falls, J. W. Davidson, 43, 1, J. M. Allen sur, 150 ft from n and e lines.

CLAY COUNTY—Block Nine Oil Co., Wichita Falls, W. A. Reid, 180, 18, Byers Bros.' sur, 386 ft from e and 2684 ft from s line.

CHAMBERS COUNTY—Sun Oil Co., Dallas, A. Higgins, 10, 3, Wm. Bloodgood sur, 412 ft from s and 53 ft from e line. Mills Bennett Prod. Co., Houston, E. W. Barber, 54, 4, H. Griffith sur, 140 ft from s li and 300 ft w of No. 3.

DUVAL COUNTY—H. H. Coffield, Rockdale, H. Wendt, 40, 1, Sec. 43 sur, 159 ft from s and 169 ft from e line. Jno. F. Camp, San Antonio, A. Neil, 1600, 2, Sec. 570 sur, 860 ft from nw and 1525 ft from ne line. Southwest Drilling Co., San Antonio, R. Wendt, 160, 1, Sec. 43 sur, 150 ft from s and e lines.

GREGG COUNTY—E. L. Smith Oil Co., Inc., Mexia, M. J. Register, 29, 2, G. F. Penn sur, 530 ft from e and 330 ft from n line. Jones-O'Brien, Inc., Shreveport, La., J. Loyd, 25, 4, L. B. Outlaw sur, 330 ft from s and e lines. H. W. Elliott, Fort Worth, I. Benson, 8, 2, Wm. Chisum sur, 329 ft s of center of n line. Selby Oil & Gas Co., Tulsa, Okla., M. T. Cole, 80, 4, J. M. Meador sur, 330 ft from w and 990 ft from s line. Amerada Pet. Corp., Fort Worth, L. H. Hearne, 108, 7, Jno. Ruddle sur, 330 ft from n and e lines. Alexander & Rasmussen, Tyler, J. M. Dickson, 106, 3, I. Baity sur, 807 ft from n and 330 ft from e line. Kniveton Oil Co., Tyler, W. P. Crews, 48, 2, J. W. Bradshaw sur, 179 ft from n and 110 ft from e line. Darby Pet. Corp., Tulsa, Okla., C. C. Clemens, 31, 4, D. Sanchez sur, 330 ft from e and 290 ft from s line. Roeser & Pendleton, Inc., Fort Worth, W. R. Nicholson, B, 74, 3, M. Mann sur, 286 ft from e and 330 ft from n line; W. P. Nicholson, A, 94, 5, M. Mann sur, 1190 ft from n and 286 ft from w line. Liner, Inc., Longview, J. C. Clayborn, 31, 4G, I. Baity sur, 219 ft from n and 330 ft from e line. P. T. Pond, Kauffman, O. Prothro, 8, 1, Jno. Blair sur, 119 ft from n and 330 ft from e line. Jones-O'Brien, Inc., Shreveport, La., J. Prothro, 8, 1, Jno. Blair sur, 123 ft from n and 330 ft from e line. Levi Gambill, Longview, Fee, 10, 1, I. Baity sur, 150 ft from w and 218 ft from n and s lines. Everts Drilling Co., Dallas, B. M. Barton, 10, 2, M. Van Winkle sur, 150 ft from n and e lines. L. Phillips, Gladewater, H. McNeeley, 11, 1, Wm. Chisum sur, 330 ft from n and e lines. Whittle-Kavanaugh Oil Corp., Houston, W. Smith, 5, 2, J. S. Caruthers sur, 207 ft from w and 200 ft from n line. C. J. Webster Oil & Gas Co., San Antonio, L. Martin, 20, 2, Wm. Chisum sur, 330 ft from n and e lines. Pilot Oil Co., Dallas, T. B. Harris, 92, 7, Castleberry sur, 205 ft from w and 150 ft from s line. Lee Bros. & Phillips, Gladewater, Black, 7, H. R. Hokit sur, 115 ft from n and 102 ft from w line. Koberg Oil Co., Oklahoma City, Okla., L. Martin, 26, 1, T. Johnson sur, 330 ft from s and e lines; 2, 330 ft s of center of n line. H. C. Hensley, Longview, L. Howard, 1, 1, L. Howard sur, 141 ft from w and 83 ft from s line. Petroleum Finance Corp. & Shasta Oil Co., Longview, Laird & Crim, 26, 3, L. B. Outlaw sur, 330 ft from w and 236 ft from n and s lines. Wells & Gann Drilling Co., Tyler, M. Charles, 8, 3, W. P. Chisum sur, 150 ft from s and 131 ft from w line. Stroube & Stroube, Corsicana, J. M. Bumpas, 34, 3, Castleberry sur, 330 ft from n and 420 ft from e line. Standard Oil Co. of Kansas, Wichita, Kas., J. A. Knowles, 23, 2, Jno. Blair sur, 330 ft from e li and 349 ft n of No. 1; 3, 210 ft from w li and 468 ft nw of No. 2. J. B. Bond, Longview, J. H. Alexander, 10, 2, D. Sanchez sur, 200 ft from e and 262 ft from n and s lines. Carl Olsen, Tyler, A. M. E. Ch., 1, 1, Jno. Wilkinson sur, center. Danciger Oil & Ref. Co., Fort Worth, H. C. McNeely, 17, 3, Wm. Chisum sur, 188 ft from e and 979 ft from sw line. Golding-Murchison Oil Co., Dallas, Texas, L. P. Griffin, 82, 6, M. Van Winkle sur, 77 ft from s and 117 ft from w line. A. G. Deck, Kilgore, G. Davis, 4, 1, Chisum sur, 144 ft from n and 112 ft from w line. Sinclair-Prairie Oil Co., Fort Worth, M. T. Cole, 666, 23, S. Brooks sur, 1352 ft from w and 2410 ft from n line; M. Lawson, 87, 6, C. Alexander sur, 352 ft from w and 150 ft from s line; A. A. King, 112, 6B, J. Walker sur, 330 ft from w and 1690 ft from n line; A. A. King, A, 367, 20, P. W. Warraner sur, 330 ft from s and w lines; A. A. King, B, 147, 4, Jno. Keiser sur, 25 ft from w and 1165 ft from

s line; W. H. York, 89, 4, M. Dillard sur, 330 ft from se and sw lines; J. E. Lawther, 320, 8, M. Garrett sur, 1420 ft from n and 1275 ft from w line. Liner, Inc., Longview, J. C. Clayborn, 15, 1H, I. Baity sur, 160 ft from n and 162 ft from w line; J. C. Clayborn, 31, 1D, I. Baity sur, 330 ft from w and 219 ft from s line. Lucey Pet. Corp., Longview, Kinsel, 48, 3, Kirk sur, 420 ft from e and 330 ft from s line. Continental Oil Co., Fort Worth, C. C. Crews, 160, 6, L. Perkins sur, 330 ft from e and 2410 ft from n line. Arkansas Natural Co., Shreveport, La., Hughey-Ross, 220, 7, J. Moffitt sur, 330 ft from s li and 780 ft e of No. 3; 8, 450 ft from n li and 660 ft e of No. 6; V. Calvin, 65, 4, H. Hathaway sur, 330 ft from w and 1510 ft from s line; M. D. Allison, 50, 6, Wm. Robinson sur, 330 ft from w li and 560 ft s of No. 1; J. W. Harris, B, 30, 4, G. W. Hooper sur, 330 ft from w and 247 ft from n line. Gulf Prod. Co., Houston, J. S. King, 30, 3, Chisum sur, 200 ft from s and w lines; M. Charles, 89, 6, Chisum sur, 200 ft from n and e lines. Humble Oil & Ref. Co., Houston, C. C. Clemens, 75, 4, D. Sanchez sur, 310 ft from e li and 660 ft n of No. 2. Atlantic Oil Prod. Co., Dallas, H. Pritchard, 100, 6, F. W. Johnson sur, 330 ft from n and w lines; R. C. Barnwell, C, 51, 6, McAnelly sur, 660 ft w of No. 2. Tidal Oil Co., Kilgore, E. R. D. Bivins, 203, 12, Wm. Chisum sur, 330 ft from n and 1071 ft from w line; J. S. King, 80, 9, M. Van Winkle sur, 220 ft from n and 615 ft from e line; W. Christian, 47, 4, G. W. Hooper sur, 340 ft from n and 200 ft from w line; W. E. Jones, 80, 7, G. W. Hooper sur, 330 ft from s and 875 ft from w line. Empire Gas & Fuel Co., Gladewater, A. A. Lockhart, 40, 3, M. Tenison sur, 330 ft from s and e lines; T. W. Lee, 187, 10, F. W. Johnson sur, 330 ft from n and w lines; J. T. Jeter, 123, 4, H. R. Hokit sur, 300 ft from ne li and 280 ft from ne cor. Shell Pet. Corp., Dallas, M. C. Salter, 38, 3, D. Sanchez sur, 330 ft from n and w lines; B. F. Laird, 206, 5, Jno. Wilkinson sur, 700 ft s of No. 3; J. Moore, 370, 8, F. W. Johnson sur, 370 ft from e li and 1350 ft s of No. 2. Stanolind Oil & Gas Co., Fort Worth, J. W. Akin, 80, 3, Castleberry sur, 330 ft from w and 147 ft from n line; O. Albright, 91, 6, W. H. Hart sur, 880 ft from n and 330 ft from e line; E. L. Walker, B, 52, 2, John Tate sur, 330 ft from n and w lines. East Texas Oil & Ref. Co., Dallas, P. C. Castleberry sur, 40, 3, G. W. Hooper sur, 158 ft from n and 378 ft from e line; 4, 366 ft from n li and 1560 ft e of No. 2. Sun Oil Co., Dallas, Wm. Pentecost, 131, 5, M. Scott sur, 1000 ft from n li and 750 ft w of No. 4; J. W. Akin, 163, 10, G. Thomason sur, 330 ft from n and 990 ft from w line. Simms Oil Co., Dallas, J. J. Flewellen, B, 374, 13, M. Mann sur, 330 ft from s and e lines. Magnolia Pet. Co., Dallas, A. J. Green, 41, 3, G. W. Hooper sur, 200 ft from nw and 133 ft from ne line; A. Hicks, 99, 8, D. Dainwood sur, 330 ft from w and 965 ft from s line.

HARDIN COUNTY — Rio Bravo Oil Co., Houston, Fee, 320, B137A, BBB&C sur, north of No. 136A; B138A, BBB&C sur, 180 ft s of No. 136A.

HOWARD COUNTY—American Maracaibo Co., Big Springs, Settles, A, 100, 5A, S 6, B 32, Twp. 2S, 207 ft from e and 186 ft from s line.

JACK COUNTY — Brazos River Gas Co., Mineral Wells, S. V. Van Hooser, 200, 1, J. Veal sur, 600 ft from w and 620 ft from n line; S. A. York, 48, 2, Wm. Barnes sur, 520 ft from e and 575 ft from s line.

JEFFERSON COUNTY — Gulf Prod. Co., Houston, Gladys, 590, 211, Blk. 31, J. A. Veatch sur, 12 ft from n and 8 ft from e line.

KERR COUNTY—Eastland Oil Co., Fort Worth, J. L. Love, 320, B1, J. Martinez sur, 150 ft from s and 600 ft from e line.

LIBERTY COUNTY—Republic Prod. Co., Houston, Dolbear, 800, 55, J. Devore sur, 150 ft n of old No. 55. Eclipse Oil Co., Beaumont, Barrow, 4, 2, J. Devore sur, 50 ft from n and e lines.

LA SALLE COUNTY—Frank Clark, Oklahoma City, Okla., B. K. Coleman, 40, 1, No. 514, Blk. 15, 200 ft from s and e lines.

LEE COUNTY—Paton Bros., Fort Worth, C. A. Turner, 65, 1, D. Hudson sur, 150 ft form n and 375 ft from e line.

LOVING COUNTY—McKague & Goldman, San Angelo, J. G. Allen, 40, 1, S 90, B 1, W&NW sur, 330 ft from ne and se lines.

MATAGORDA COUNTY—Shepherds Mott Interests, Fort Worth, Hawkins, 1000, 1, D. McCarthy sur, 1320 ft from e and 5247 ft from n line.

RUSK COUNTY — Golding-Murchison Oil Co., Dallas, L. J. Pinkston, A, 87, 3, M. J. Pru sur, 194 ft from w and 944 ft from s line. Standard Oil Co. of Kansas, Wichita, Kas., M. L. Thompson, 59, 3, I. Moore sur, 330 ft from s and e lines. Kirby Pet. Corp., Houston, J. Reddic, 98, 5, T. Grace sur, 330 ft from w and 1650 ft from s line; 4, 330 ft from w and 990 ft from s line. Rhodes Drilling Co., Fort Worth, S. Brox, 20, 2, Thos. Grace sur, 330 ft from s and e lines. Butler & Calhoun, Tyler, Bohanan, 8, 1, W. G. Tutt sur, 150 ft from n and e lines. Oil Properties Corp., Houston, E. B. Alford, 3, 1, I. G. Parker sur, center. Lone Pine Oil Co., Tyler, J. B. Wilson, 10, 2, M. J. Pru sur, 330 ft from w and 162 ft from n and s lines. Sonbar Oil Corp., Eldorado, Ark., A. P. Finney, 62, 6, I. G. Parker sur, 780 ft w and 330 ft from s line. B. L. Snyder, Dallas, H. P. Leverett, 16, 2, J. A. Lindley sur, 200 ft from n and 222 ft from w line. International Oil Co., Dallas, L. J. Pinkston, 21, 2, J. B. Cadena sur, 330 ft w of center of e line; 3, 330 ft e of center of w line. R. H. Dearing, Dallas, T. H. Goforth, 41, 4, Lindley & Tutt sur, 50 ft s of center of n line. T. C. Adams, Bethany, La., J. E. Arnold, 10, 3, M. J. Pru sur, 236 ft from w and 450 ft from s line. Olsan Bros., Henderson, J. S. Powers, 131, 6, J. Womack sur, 990 ft from w and 150 ft from s line. Louisiana Oil & Ref. Co., Shreveport, La., W. M. Jernigan, 111, 7, M. McCabe sur, 330 ft from n and e lines. British American Oil Prod. Co., Tulsa, Okla., M. Kangera, 70, 6, M. J. Pru sur, 208 ft from s li and 450 ft e of No. 3. Houston Prod. Co., Houston, W. P. Brightwell, 20, 2, E. G. Sevier sur, 200 ft from n and w lines. C. Cockerham et al, Shreveport, La., A. J. Deason, 5, 2, M. J. Pru sur, 236 ft from e and 108 ft from n and s lines. Devonian Oil Co., Tulsa, Okla., R. A. Motley, 442, 14, Wm. Killen sur, 990 ft from s and 3504 ft from e line. Golding-Murchison Oil Co., Dallas, E. L. Pinkston, C, 84, 5, Pena sur, 330 ft from e and 489 ft from n and s lines; H. L. Griffin, 86, 5, Pena sur, 330 ft from e and 479 ft from n and s lines; Pinkston, A, 89, 4, M. J. Pru sur, 330 ft from s and e lines. Gulf Prod. Co., Houston, H. Johnson, 102, 4, H. B. Dance sur, 330 ft from n li and 660 ft w of No. 3; J. W. Shaw, 90, 3, F. Cordova sur, 164 ft from n li and 660 ft w of No. 2; A. H. Rayford, 30, 3, F. Cordova sur, 164 ft from n and s li and 660 ft w of No. 2; Mayfield, D, 54, 5, J. B. Cadena sur, 330 ft from e and 150 ft from s line; C. E. Christian, 92, 7, M. McCabe sur, 330 ft from n and e lines; R. M. Griffin, 66, 8, I. Ruddle sur, 252 ft from n and 1103 ft from e line. Clint Wood Drilling Co., Tyler, J. B. Irwin, 35, 3, J. L. Lindley sur, 330 ft from n and 990 ft from e line; J. B. Irwin, 36, 3, J. Lindley sur, 330 ft s of center of n line. Solar Exploration Co., Kilgore, H. H. Leach, 10, 1, J. C. Barrett sur, 330 ft from n and w lines. East Texas Oil & Ref. Co., Dallas, W. W. Holland, 18, 2, M. J. Pru sur, 150 ft from n and e lines; D. Wills, 83, 3, Wm. Chisum sur, 248 ft from s li and 660 ft w of No. 2; J. Roberson, 14, 1, T. Grace sur, 330 ft from w and 275 ft from n and s lines; H. Barksdale, 15, 2, M. J. Pru sur, 330 ft from w li and 203 ft from n and s lines. Sinclair Prairie Oil Co., Fort Worth, J. W. Fletcher, 36, 1, Wm. Clark sur, 330 ft from s and 352 ft from e and w lines; D. Bradford, 36, 3, J. Ximinez sur, 250 ft from s and 340 ft from e and w lines; P. S. Tipps, 230, 2, B. J. Poindexter sur, 990 ft from e and 330 ft from n line; W. T. Grissom, 50, 3, W. D. Porter sur, 330 ft from s & w lines; 4, 330 ft from s and e lines; M. Kennedy, 52, 3B, D. Clark sur, 1444 ft from w and 212 ft from n line. Humble Oil & Ref. Co., Houston, L. R. Reid, 70, 3, T. J. Martin sur, 330 ft from e and 443 ft from s line; J. W. Turner, 57, 10, T. H. Smith sur, 330 ft from n and 990 ft from w line; H. Sexton, B, 64, 7, M. McCabe sur, 330 ft from n and w lines; J. D. Florey, 89, 4, T. J. Martin sur, 2396 ft from n and 330 ft from w line. H. L. Hunt, Tyler, H. C. Maxwell, 109, 7, F. Cordova, sur, 570 ft e of No. 2; C. Young, 126, 7, M. J. Pru sur, 330 ft from n and w lines. Mid-Kansas Oil & Gas Co., Shreveport, La., C. L. Graham, 320, 2, P. Tipps sur, 177 ft from n and 2323 ft from e line; J. M. Price, 55, 4, J. B. Cadena sur, 330 ft from s and e lines; M. M. Cross, 815, 17, J. B. Cadena sur, 150 ft from n and 330 ft from e line; J. Mills, 44, 5, J. B. Cadena sur, 108 ft from n li and 500 ft w of No. 1; C. D. Graham, 135, 7, J. B. Cadena sur, 330 ft from e and 1308 ft from s line; G. W. Moore, 92, 3, W. J. Roan sur, 330 ft from n and w lines; D. Ledbetter, 212, 3, W. J. Roan sur, 330 ft from s and w lines; J. F. Mason, 104, 4, J. B. Cadena sur, 330 ft from e and 286 ft from s line; J. Lunsford, 70, 3, J. B. Cadena sur, 330 ft from n and w lines; M. A. Price, 202, 5, J. B. Cadena sur, 330 ft from s and w lines; M. M. Cross, 815, 19, E. B. Foulks sur, 500 ft sw of No. 13. Stanolind Oil & Gas Co., Fort Worth, R. A. Moores, 251, 10, J. B. Cadena sur, 330 ft from s and 1012 ft from w line; R. Christian, 87, 3, W. Cooke sur, 330 ft from n and e lines; M. Schuyler, A, 51, 2, J. B. Cadena sur, 330 ft from n and 990 ft from e line; M. Schuyler, 74, 4, J. B. Cadena sur, 559 ft from w and 1066 ft from n line; R. A. Moores, 251, 8, J. B. Cadena sur, 441 ft from e and 330 ft from s line; 9, 1030 ft from e and 330 ft from n line. Tidal Oil Co., Kilgore, Buntyn, B, 2, J. C. Snow sur, 150 ft from n and e lines; J. Bean, 85, 5, L. Lewis sur, 240 ft from sw and 226 ft from nw line; O. Whittington, 39, 2, J. Darley sur, 200 ft from s and 425 ft from e line. Magnolia Pet. Co., Dallas, C. C. Still, 100, 6, M. McCabe sur, 300 ft from w and 295 ft from n and s lines. Republic Prod. Co., Houston, N. Bean, 9, 2, J. Lewis sur, 200 ft from s and w lines, amended location. H. P. Leverett, 109, 4, W. Simms sur, 330 ft from w and 295 ft from s line. Shell Pet. Corp., Dallas, A. Holt, 59, 2, D. Clark sur, 215 ft from w and 152 ft from n line.

SMITH COUNTY—Summit Drilling Co. & Shell Pet. Corp., Dallas, Mayfield, 200, 6, Jas. Jordan sur, 330 ft from s and 280 ft from e line. McMahon, McCulloch & Moore, Tulsa, Okla., S. S. Cock, 40, 6, Jas. Jordan sur, 330 ft s of center of n line. W. L. & T. L. Sessions, Dallas, S. Stone, 51, 2, D. Shaw sur, 330 ft from s and w lines. Long Oil Co., Henderson, G. A. Turner, 113, 2, D. W. Campbell sur, 330 ft from s and e lines. Texas Co., Shreveport, La., A. S. Jarvis, 162, A8, I. Moore sur, 330 ft from s and 1325 ft from w line; A7, 330 ft from s and 1990 ft from w line. Gulf Prod. Co., Houston, J. Wiley, 116, 6, Jas. Jordan sur, 330 ft from n and w lines. Mid-Kansas Oil & Gas Co., Shreveport, La., J. H. Sharp, 483, 7, M. S. Coy sur, 330 ft from s and e lines; M. Cross, 815, 21, I. Proctor sur, 330 ft from s and w lines. Sun Oil Co., Dallas, H. A. Pace, B, 644, 4, J. Vargas sur, 330 ft from e and 489 ft from s line; J. D. Henson, 217, 9, J. Vargas sur, 282 ft from w and 330 ft from s line.

SHACKELFORD COUNTY — R. C. McCarter, Rising Star, L. T. Ledbetter, 240, 1, 658 TE&L sur, 213 ft from ne and 460 ft from se line. Welch & Dyess, Albany, W. H. Stephens, 146, 12, S 6, Bayland. Asy sur, 800 ft from n and 400 ft from w line. J. A. Bearman, Cisco, J. B. Mathews, 148, 1, S 4, B 1, E. T. Ry. sur, 300 ft from e and 600 ft from s line. Dickey Bros., Albany, E. Webb, 320, 9, S576, TE&L sur, 390 ft ne of No. 8. C. S. Carroll, Dallas, R. T. Moberly, 100, 1, S 59, B 11, T&P sur, 660 ft from s and w li sw¼ of ne¼. E. G. Johnson, Abilene, R. Carter, 23, 1, S 70, LAL sur, 400 ft from w and 500 ft from n line. J. T. Gist, Albany, J. A. Rodriguez, 23, 11, S 20, B 11, T&P sur, 940 ft from n and 720 ft from w line. A. C. Walker, Albany, L. H. Hill, 40, 6, S 38, Bayland Asy. sur, 300 ft s of nw corner. James & Klnger, Albany, E. Webb, 118, 1, S 19, B 11, T&P sur, 1000 ft from w and 1500 ft from n line. Albany Oil Co., Breckenridge, E. A. Jeter, 80, 3, S 14, B 11, T&P sur, sw of No. 2; 4, se of No. 3; 5, ne of No. 3.

STARR COUNTY—Kirk Cornell, McAllen, K. Bass, 480, 2, Por. 75-76-77, Secs. 8 and 9, 450 ft from n and w lines.

UPSHUR COUNTY — Dean & Adkisson, Fort Worth, C. M. Victory, 40, 4, E. A. J. Evans sur, 330 ft from n and e lines. Mannus & Snuggs, Gilmer, J. M. Pool, 55, 1, S. J. Pounds sur, 330 ft from n and w lines. Weaver & Stanolind Oil & Gas Co., Fort Worth, C. B. Everett, C, 40, 1, Wm. Goodwin sur, 330 ft from s and e lines. East Texas Oil & Ref. Co., Dallas, B. Doby, 43, 4, M. Mann

sur, 330 ft from e and 700 ft from n line. California Pet. Co., Shreveport, La., I. Walker, 120, 9, S. Harrell sur, 330 ft from n and w lines. Texas Co., Shreveport, La., H. L. Phillips, 136, 3, D. B. Choate sur, 150 ft from n and e lines. Humble Oil & Ref. Co., Houston, J. Phillips, 75, 4. H. H. Edwards sur, 500 ft from w and 330 ft from s line. Simms Oil Co., Dallas, J. J. Flewellen, A, 200, 8, M. Mann sur, 330 ft from n and 6315 ft from e line. Magnolia Pet. Co., Dallas, O. F. Smith, 92, 4, H. H. Edwards sur, 330 ft from s li and 660 ft w of No. 3; L. Graves, 32, 2, M. Irwin sur, 330 ft from e and 361 ft from n and s lines.

UPTON COUNTY—Gulf Prod. Co., Houston, J. T. McElroy, 640, 100, S 195, B F, CCSD&RGNG sur, 1320 ft from n and e lines.

VAN ZANDT COUNTY — Pure Oil Co., Fort Worth, B. W. Russell, 30, 3, D. Rose sur, 650 ft from e and 150 ft from s line.

VICTORIA COUNTY—Humble Oil & Ref. Co., Houston, P. Rydolph, 1, J. F. Kemper sur, 2617 ft from ne and 1013 ft from nw line.

WARD COUNTY — Abell Bros., Midland, Pure-Smith, 320, 2, S 4, B 34, H&TC sur, 330 ft from se and 290 ft from ne line; Pure-Smith, 3, 1100 ft from n and 330 ft from e line. Gulf Prod. Co., Fort Worth, G. W. O'Brien, 640, 22, S 16, B F, GMMB&A sur, 1100 ft from n and 330 ft from e line. J. H. Leindecker & Cayton, Royalty, J. B. Bennett, 80, 1, S 16, B 34, H&TC sur, 330 ft from s and w lines.

WICHITA COUNTY—C. T. Richards, Electra, G. W. Dierner, 1, B 326, Wag. Co. sur, 150 ft from n and w lines. C. R. Conyers, Electra, C. A. Mertens, 55, 1, No. 2 sur, 150 ft from n and w lines. H. B. Hill, Wichita Falls, W. W. Overby, 50, 2, J. M. Sharp sur, west of No. 1. Rathke Oil Co., Wichita Falls, J. L. Jackson, 160, 1, B 27, DCSL sur, No 4, 150 ft from n and e lines.

WEBB COUNTY—Blair & Livingston, Laredo, J. M. Garcia, 40, 1, S 1100 sur, 150 ft from n and e lines ne¼ of nw¼. French Oil Corp., Laredo, R. Benavides, 40, 1H, sur 663, 1470 ft from e and 1980 ft from s line.

WILBARGER COUNTY—Texas State Oil Co., Dallas, J. F. Shipley, 560, 1, S 1, B 18, H&TC sur, 150 ft from w and 750 ft from n line.

YOUNG COUNTY — Triangle Pet. Corp., Fort Worth, J. Kisinger, 40, 2, J. Connor sur, 200 ft from s and w lines. Iron Mountain Oil Co., Tulsa, Okla., M. E. McBrayer, 225 1, 1907 TE&L sur, 175 ft from w and 463 ft from n line. King Royalty Co., Wichita Falls, J. F. Larimore, 160, 40, 2246 TE&L sur, 150 ft from n and 1650 ft from e li s½. J. C. Cunningham et al, Graham, G. Stewart, 80, 1, D. Dawson sur, 750 ft from s and e lines. W. R. Cooper, Olney, J. R. Nelson, 54, 1, 162 TE&L sur, 150 ft from s and 1716 ft from e line. A. H. & S. P. Schmidt, Wichita Falls, T. J. Routon, 40, 9, 22 TE&L sur, 750 ft from s and 553 ft from e line. C. C. Williams, Jean, E. C. Keith, 60, 2, 267 TE&L sur, 450 ft from w and 150 ft from s line. F. E. Butler et al, Fort Worth, W. F. Finch, 60, 9, 31, TE&L sur, 150 ft from e and 541 ft from s line. Wooten & Reed et al, Graham, B. F. Barrett, 63, 1, E. W. Sargent Sec. 2 sur, 862 ft from e and 727 ft from n line. Texas Co., Wichita Falls, E. L. Burns, 265, 1, 1986, TE&L sur, 990 ft from n and w lines. A. Z. Kouri, Wichita Falls, I. E. McClatchey, 53, 1, 1476 TE&L sur, 150 ft from n and 1665 ft from w lines. Kleiner & Riggs, Graham, J. F. Larimore, A, 80, 11, 2246 TE&L sur, 150 ft from s and 750 ft from e line; J. F. Larimore, B, 81, 10, 22 TE&L sur, 150 ft from e and 816 ft from s line. Simmon & Lively, Loving, L. R. Drum, 50, 3, S. Tyner sur, 150 ft from e li and 215 ft s of No. 1.

ZAPATA COUNTY—Allied Oil & Gas Co. & Allen & Morris, Laredo, E. Gutierrez, 532, 23, No. 4 Las Comitas sur, 550 ft from se and 1765 ft from ne line; 24, 750 ft from se and 1478 ft from ne line; 25, 150 ft from ne and 1225 ft from se line. H. H. Coffield, Rockdale, S. Bustamante, 80, 2, No. 34 Fansler sur, 150 ft from ne and se lines; 3, 150 ft from ne and 450 ft from se line. McGinley Corp., Fort Worth, G. T. Montemayor, 40, 2, Sur 64, Blk. 2, 150 ft from s and e lines. Windsor Oil Co., Houston, J. M. Martinez, 40, 1, Blk. 15, W. R. Duke sur, 150 ft from nw and sw lines. Donohoo, Stevens & Brown, Laredo, A. Garcia, 40, 1, Sh. A, Blk. 7, C. Redondo sur, 150 ft from ne and se line.

SOUTH TEXAS

Fourth Well Brings Duval Into Assured Play. Unit Block Assembled for Wilson County Test.

EARL POST, *Staff Representative, San Antonio*

Duval County Field Gets Fourth Well

San Antonio.—J. S. Suttle et al's L. Bennett 1, northeast of Rosita and more than two miles north and east of the producing area of the Government Wells field, Duval County, May 30 was flowing 2800 barrels through a one-fourth inch choke. This well is 2329 feet deep and only 15 inches in the formation.

The well establishes another pool in the prolific Government Wells field. It is the fourth producing sector of the field and the second to be discovered in a little more than a month, the other being Capps and Smith's Duval County Ranch Company 1-A, several miles south and west of the field.

The Suttle well hit the sand earlier in the month and flowed several minutes on a drill stem test. Casing was set and the test brought in May 28, when it flowed 90 barrels an hour for three hours through ⅜-inch choke, showing 75 pounds pressure on the tubing. The well was then closed and reopened May 30 with one-quarter inch choke being used, allowing 300 barrels more oil to flow. This time, it showed the 2800-barrel rate. It has been closed in due to shortage of storage.

The test was started by Suttle and several associates. When it tested the sand, a contract was made with the American Gas Company to take over the well and complete it. A corporation is being formed of those holding interests in the well and leases, which total 253.33 acres, the consumation of which will bring about the immediate drilling of additional wells. This organization is said to be on a deal at this time to sell 3,000,000 barrels of oil from these leases to be carried through the Humble Pipe Line Company's line, as common carrier, to Port Aransas.

Other wells in the Government Wells district drill from 10 feet to 100 feet through series of sands and shales to obtain their production and average from 300 to 2000 barrels initial.

Since the discovery of the Suttle producer and the Capps and Smith well, Duval County has come very much into the spotlight of the South Texas oil development. It has been the center of considerable lease and royalty trading and is now one of the most active spots in South Texas.

The Government Wells field, now nearly eight miles long, counting the four producing areas, is due to be the center of much wildcatting.

Two offsets have been made to the Suttle Bennett well, both by the Magnolia Petroleum Company. Gilbert Wendt 1 is a north offset and J. T. Johnson 1 is an east offset.

South of Government Wells, The Texas Company Ruiz 1, one-mile east of the production, was coring at 2597 feet. It had several slightly saturated cores above this level, but none gave promise of the production.

Sun Oil Company is within a few feet of the sand in its Cano 1, 950 feet southeast of the Capps and Smith well. It is in the east quarter of section 576. The Magnolia is around 2000 feet in its M. Ruiz 1, Section 574.

A test to attract much interest is the one being started by E. R. Thomas on the Wood Welder lease five miles northeast of the town of Rosita. The location is 300 feet from the south and east lines of Section 383.

Flowing Well Added In Saxet Field

San Antonio.—Tule Lake Oil Corporation (James K. Kepley) has a producer at 4065-74 feet in its C. D. Sevier in the Saxet field, Nueces County. The well is flowing around 140 barrels through one-fourth inch choke and showing 900 pounds pressure. This well is 200 feet from the south and east lines of the 100-acre lease in Porcions 582-583-311.

Pat Rutherford's J. Hunter 1, northeast offset to Gulf Coast Oil Company's Sedwick 2, 4500-foot producer, tested salt water after being drilled in. This well showed nine joints of mud and three joints of oil in one and one-half minutes in a drill stem test from 4808-12 feet. Casing was set and the test drilled in, where it failed to produce.

Gulf Coast Oil Company is rigging up on its Elder 2, which is virtually an offset to the same operator's Perkins and LaGasse 1, Section 26, which has been running wild since May 6. This test has the oil sand at 4556-66 feet,

where casing is set, but the sand at about 1650 feet is creating the trouble.

V. B. Hillegeist's McGregor 1, Survey 311, has passed up the shallower sands, being below 4400 feet at last reports.

Gulf Coast Pipe Line Company is laying a six-inch pipe line from the Saxet field to the turning basin at Corpus Christi, where it also is erecting 80,000 barrels storage.

Two Producers Due In Pettus Field

San Antonio.—The United Production Corporation has two more producers indicated in the old Pettus field, Bee County. They are Ray 42, near 41 in the George Kerr Survey, and Ray 43, just northeast of the field in the T. Hanson Survey. The first well topped the sand at 3921 feet, took about ten feet of pay and is being completed, while the latter topped the pay at 3921 feet and is being drilled in.

The Normanna district, a few miles south is holding some interest with its wildcats. The Texas Company's J. Scott 1, J. Uranga Survey, being drilled on the United Production Company property, is nearing the expected pay level, having passed 3400 feet. It is one mile south of the townsite and near the field. The Gulf Coast Oil Company recently abandoned a semi-deep prospect in the field, but likely will drill another. It is understood that this company took over the producing properties in this district with a contract to drill probably five or more tests.

Southwest Pettus is getting one well. It is T. B. Slick Estate's Ray 6, 400 feet north of Ray 3, Kerr Survey. The well is down 3620 feet, due to hit the sand within a short time. It calls for an offset by the Texas Company, location for which already has been made. It will be Gremmel 5, John Pace Survey.

Fourth Well Started In Goliad County

San Antonio.—Stanolind Oil & Gas Company and John F. Camp are making another attempt to open a field at Cabeza Creek in western Goliad County, where they have drilled three failures. The newest well is Pettus 4, located 1000 feet south and 55.5 degrees east of the Pettus 1. It has spudded and set surface casing.

The first well made a small oil and gas well, showing lots of salt water at 4286 feet.

Caldwell County Test To Be Drilled Deeper

San Antonio.—In the district recently opened Bob Rose in Caldwell County, two miles northeast of Luling the Empire Gas and Fuel Company's W. P. Walker 1, Solomon Seal Survey, was coring in soft Taylor at 2087 feet later in the week, showing no signs of encountering the crevice. The well likely will be carried to the Edwards before being abandoned.

Bobrose Oil Refineries, Inc., was moving in material for its Walker 1, 2763 feet northeast of the producer. Also northeast of the producer, Cole et al have made a location for their Pierce 1, located 440 feet from the northeast line and 445 feet from the northwest line of the 100-acre tract in the Seal Survey.

Wilson County Unit Block to Be Drilled

San Antonio, Texas.—Four major operators have formed a 3500-acre wildcat acreage block for unit development in Wilson County, and a location for a test has been made on it in the Ignac Tudyk tract, John Turner Survey. The companies participating in the development are Sun Oil Company, Empire Gas & Fuel Company, Humble Oil & Refining Company, and Magnolia Petroleum Company.

The prospect is only a short distance southeast and across the county line from the Cooksey pool of south-central Bexar County, a small field owned and operated on a unit basis by Penn Oil Company, Sun Oil Company and Witherspoon Oil Company, and yielding 35 gravity oil from sand around 1500 feet deep in the upper part of the Taylor formation. Oil in the latter area is trucked to the Witherspoon refinery at Somerset.

Constantin-Wrather Not To Press for Damages

Houston.—Joseph Weldon Bailey of Dallas, attorney representing Constantin and Wrather, oil operators of East Texas who obtained a temporary injunction against military proration on their East Texas properties, stated in Houston May 30 his clients would not press for monetary damages against the governor, as asked in the suit which now is on appeal.

South Texas Field Developments

Completions

Company, Well and Location	Initial Production Bbls.	Depth
BASTROP COUNTY—		
I. L. Champion, Owens 1, Isaac Cosner sur, 3 mi ne Elgin.....	*	2280
Evans and Auld, Mrs. D. J. Orgain 1, Addison Litton League, 2 mi n Yoast field	*	1770
BROOKS COUNTY—		
Allen & Morris, Holbein-Wormser 1, Alta Mesa, Palo Blanco de Maguellos grant, had gas blowout, damaged hole	*	1819
DUVAL COUNTY—		
Frank Gravis, Schallert 2, Blk 10, Cain & Smith sub, Sur. 255, shut down for months, dropped	*	1660
F. P. Hynes, Fee 1, Sec. 196, Blk. 26	*	3000
O. W. Killam, W. R. Peterson 1, Sec. 1, shut down for months, dropped	*	2725
J. S. Suttle et al, L. Bennett 1, Sec. 44, J. Poitevent sur, drilled only 15 inches into sand, flow on ¼ choke	2800	2329
NUECES COUNTY—		
Tule Lake Oil Co., C. D. Sevier 1, Por. 582-583-311, Saxet field, flow on ¼-inch choke, 900 lbs. pressure, top sand 4065 ft	140	4074
STARR COUNTY—		
Edwin M. Jones, E. T. Chatfield 1, blk. 3, Por. 80, w discovery	*	2005
Sioux Oil Co., Goodrich 2, tract 5, Por. 81	*	1450
Jack Tarver et al, V. C. de Guerra 1, Por. 79, plugged back to gas sand 2146 ft, could not cut off water	*	2591
Kelsey Bass 4, Los Olmos field, Por. 75-76-77, top sand 547	50	570
VICTORIA COUNTY—		
T. B. Slick Estate, Inc., McFadden 2, J. Varin sur, top sand 4485 ft, show 1650 lbs. pressure, spray some distillate	140	4493
WEBB COUNTY—		
Magnolia Pet. Co., F. Benavides 2, sur 660, W Cole.....	50	2340
ZAPATA COUNTY—		
Allied O&G Co., Gutierrez 24, Escobas field	100	1478
J. M. Blair & Sons, H. T. Montemayor 1, blk 1, sur 63	*	1408
O. W. Killam, Barrocito 1, J. V. Borrego Grant	*	2562
Medina 8, Share 34, Escobas field	100	1447

Wildcat Drilling Report

(Wells shut down not included)

BASTROP COUNTY — Campbell & Tong, Yoast 8, Garcia sur, Yoast field, prep to spud (last report error). L. Champion, Owens 1, Cosner sur, 3 mi ne Elgin, dr abt 1435 ft.

BEE COUNTY—Humble O&R Co., Laura Thompson 1, Garrett Roche sur, dr 750 ft. C. G. Nichols, J. P. Harris 1, sec. 2, Durango Grant, dr 1550. T. B. Slick Estate, Inc., Ray 6, Geo. Kerr sur, 400 ft n No. 3 sw Pettus, dr 3620 ft. Texas Gulf Prod. Co., Webb Hearn 1, 1500 ft ne Wood 1, P. & T. Irrigation Co., sur, dr 3590 ft. The Texas Co., L. Gremmel 5, Jno. Pace sur, sw Pettus, 400 ft n No. 1, to move on. United Prod. Co., George Ray 42, Geo. A. Kerr sur, sand 3921-31 ft, completing; George Ray 43, Thos. Hanson sur, top sand 3922 ft dr in; J. Scott 1, (dr by Texas Co.) J. Uranga sur, 1 mi s Hermanna, dr 3400 ft.

BEXAR COUNTY—American Gas Co., Kennon 5, M. F. Rodriguez sur No. 4, Gas Ridge,

dr 2200 ft. Alamo Nat'l Gas Co., Coreth 1, Menchaca sur, Eckert pool, spud in. S. W. Blount, Jr. et al, S. A. Land Co. 1-A, Perez sur, 750 ft. Chiquita Oil Co., R. Pollock 4, J. W. Rialls sur, Cooksey, top sand 1463 ft, td 1480 ft, run tubing. Davis, Noble & Bender, S. A. Farms 1, blk 81, test water and oil, 1160 to 1190 ft. Moore & Jawer, Holley Ellison 1, 14 mi w S. A., to re-dr 2170 ft.

BROOKS COUNTY—Allen & Morris, Holbein-Wormser 1-A, Palo Blanco de Maguellos Grant, Alta Mesa, set 250 ft 10-in csg. M. P. Evans, J. M. Martinez 1, La Escantada sur, blk 11, lcn. Ed East et al, Rudolpho Garza 1, Alta Mesa dr 860 ft. E. G. Sterns, B. Myrick 1, blk 3, lot 2, Falfurrias, spud in. Otto Woods et al, Matilda Martinez 1, Longoria league, 25 mi sw Falfurrias, dk.

CALDWELL COUNTY — Bobrose Oil Refineries, Inc., Walker 1, S. Seal sur, ¼ mi s Walker well, lcn. Cole et al, Pierce 1, Seal sur, ¼ mi ne Rose well, dk. Louis Creuch, Sue Nealson 2, dk. Empire Gas & Fuel Co., W. P. Walker 1, Seal sur, se offset Rose well, spud in. George C. Sullivan (Shell) Plimsoll 1, M. W. Dennis sur, dr 876 ft shale. C. J. Webster O&G Co., W. W. McCrory 1, McNeil sur, (discovery) shot in Buda, milled out csg, cleaned, prep to run tubing, td 2279 ft. C. T. Robertson 1½ mi sw McCrory well, John Neill sur, steel dk up, wait on completion of McCrory well for rig.

DEWITT COUNTY—Pat Armstrong, E. T. Clark 1, Jose Santos sur, dk. J. F. Richardson, 1, Taylor 1, D. Albrete sur, lcn. Texas Co., McCrabb 1, at Thomaston, James Quinn, dr 600 ft.

DUVAL COUNTY — Aztec O & Royalty Co., Duval Co. Ranch Lands 1, sec 322, ru. John F. Camp Weil 2, sw No. 1, sur 57, ru. Coffield et al, Wendt 1, sur 43, ½ mi w Suttle well, lcn. Cole Pet. Co. Benavides 75, blk 8, sur 9, Mariano Arispe Grant, Cole Bruni, dr 5190 ft. Co-operative Dr. Co., Dinn 5, blk 5, sur 545, dr 1645 ft. Duval Oil Corp., Bishop 10, sur 135, Gov't wells, top sand 2365 ft, set csg. Mag. Pet. Co. M. Ruiz 1, sec 574, BS&F, dr 1200 ft; Gilbert Wendt 1, sur 44, n offset Suttle well, Rosita, lcn; J. T. Johnson 1, sur 44, ne Suttle well, Rosita lcn. Plymouth Oil Co., A. Pharr 1, blk 48, San Andres Grant, prep to spud. Southwest Dr. Co., R. Wendt 1, sur 43, Rosita, lcn. Sun Oil Co., Cano 1, sec 576, dr 2150 ft. The Texas Co. Ruiz 1, n cor sec 127, dr 2228 ft, sand, only slight odor; Peters 1, sur 162, Kohler pool ru. E. R. Thomas, Wood Welder 1, sur 383, 5 mi ne Rosita, lcn.

GOLIAD COUNTY—Benedum & Trees and Plymouth Oil Co., Parks 2, se cor BS&F sur No. 8, sd for csg 5137 ft. Gulf Prod. Co., O'Conner 1, Morris sur, dr 1250 ft. Humble O&R Co., M. Fromme 1, G. W. Kersey sur, 3 mi n Goliad, dr 2850 ft. Slick-Seeligson, Allen 2, Obid Marshall sur Slick pool, sand 4198-4213 ft fish for packer. Stanolind O&G Co & John F. Camp, Pettus 4, Cabeza Creek; spud in.

ABBREVIATIONS

NOTE—The following is the explanation of abbreviations, signs, etc., used in completion and wildcat reports: *—dry hole, abandoned well; ‡—salt water; †—junked and abandoned; ¶—million feet of gas; abn — abandoned; bbls—barrels; b.s—basic sediment; cas—casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in.—inches; lcn—location; m—milling; n s, e, w—north, south, east, west; r—reaming; sd — shut down; sdtr—side-tracking; sp — spudding; sr — straight reaming, std — standardizing; sw — salt water; td — total depth; ur—underreaming; wo — workover; wosr—waiting on standard rig.

GUADALUPE COUNTY—Humble O&R Co. Sue E. Dennan 5-C, Wm. Arrington sur, Darst Creek, dr 1100 ft. Sal Mar Oil Corp., A. H. Zunker 1, L. Ballinger sur, between Seguin and Darst Creek, dr 1100 ft. Sun Oil Co., Dowdy 2, Darst Creek, Jacob Darst sur, dr 150 ft.

HIDALGO COUNTY—B. H. Adams, J. D. Brock 1, por 79, blk 15, coring 4480 ft.

JIM HOGG COUNTY—Clark and Cowden Oil Corp., E. Vela 1, sec 573, El Peyote Grant, spud in. D. C. DeWitt, T. Gomez 1, sec 12, dr 1450 ft. E. Hough, N. Hinnant 1, sec 20, Fansler sur, blk 8, to spud in. R. L. Huckett et al, F. C. Guerra 1, sec 86, blk 6, dr 1615 ft.

JIM WELLS COUNTY—Carroll Brown et al, Doering 1, tract 4-A, Chas. Seefeld Farm lots, 5 mi s Alice, dk. F. A. Lain V. Porter 1, tract 25, near Sandria, re-dr 500 ft. S. J. Sloan, G. W. Wade 1, C. Blanca sur, blk 6, dr 1775 ft.

KARNES COUNTY—Pickett et al, Myers 1, 2 mi sw Runge, dr 2100 ft.

KERR COUNTY — Eastland Oil Co., Jeff Love 3, sec 1594, spud in.

LIVE OAK COUNTY—Catlett & O'Neill, H. D. Miller 1, Wm. Cabbon sur, dr 900 ft.

McMULLEN COUNTY—Jacob, Buzzini & Pickett, Inc., J. Jacob 3-A, sec 8, W. H. Jacob sur No. 8, Jacob pool, sand 952-60 ft completing; J. Jacob 4-A, 660 ft w 3-A, lcn; Jacob 5-A, 660 ft n 2-A, lcn; J. Jacob 1-B, section 15, GH&HRY sur, 1¼ mi n and e discovery dk; Jacob 1-C, sec 47, J. Pointevant sur, 2 mi nw field, lcn. Longhorn Oil Co. and American Gas Co., Lark 1, E. W. B. Scrugham sur, Calliham field near Live Oak County line, lcn.

MEDINA COUNTY—R. Robertson Dr. Co., J. J. Little 1, BS&S sur, No. 2, dr below 350 ft. Arnot and Fincke, New Cannon 1, blk 2, F. Memme sur, dk. Kyser and Roberts, Ward 3, Levi Taylor sur, lcn. Kyser and Nichols, Irwin 1, Levi Taylor sur, dk. R. M. Yantis, Adams 1, Fred Mumme sur, lcn.

NUECES COUNTY — Gulf Coast Oil Co., Perkins and La Gasse 1, H. B. Shepherd sur, Saxet field, td 4556 ft, 6⅝-in csg set 4546 ft, blew in wild from 1650 ft sand, cratered around surface csg, still wild, Elder 2, dk. V. G. Hillegeist, McGregor 1, sur, 311, Saxet field, dr 1000 ft. Rutherford Dr. Co., J. Hunter 1, Saxet field, sand 4808-12 ft, made sw when dr in, sd for orders. Stanolind O&G Co., King 2, sec 23, King Gas field, dr 820 ft.

REFUGIO — Humble O&R Co., M. M. O'Conner 1, J. Keating sur, dr 4560 ft; O'Conner 2, J. Keating sur, dr 4570 ft. Edwin M. Jones, Josephine Mitchell 1-B, Refugio Town lots, dr below 9000 ft. Larcro Gas & Pet Co., Strauch 5, lot 6, blk 2, Refugio, dr 4225 ft. Pearson Properties, Ryals 2, dr 5510 ft. United Prod. Co., Fox 3, Hews and Brown sur, td 6820 ft, plug back; Fox 4, Hews and Brown sur, dr 6205 ft; Fox 5, Hews and Brown sur, dr 6310 ft.

STARR COUNTY—Allison & Roberts, Kelsey Bass 1, sec 6, spud in. Coastal O&G Co., Kelsey Bass 1, blk 52, below 600 ft; Olivarez 1, share 35, por 80, to spud in. Day & Co., Kelsey Bass 1, sec 6, dr 410 ft. H. F. Griffith et al, Kelsey Bass 1, sec 11, dr 835 ft. Gulf Coast Oil Co., Perez 1, share 16-C, por 80-81, dk. P. A. Hoffman, Goodrich 1, blk 6, tract 5, por 81, dr 400 ft. R. E. Johnson, Fee 1, tract 32, por 80, dr 1410 ft. King Pin Oil Co., Lewis 1, share 22, por 80, dk. Frank LaBorde 1, Marroquin 1, tract 20, por 75, dr 420 ft. T. C. Patten Kelsey Bass 1, sec 8, to re-dr 1050 ft. R. H. Pursely, Hinojosa 1, center blk 96, Rio Grande City, lcn. Sinclair & Rutherford, J. T. Canales, share 69, por 79, lcn; Kelsey Bass 1, sec 6, spudded at last report. Stryalls Oil Corp., Maria R. G. de Salinas 1, Share 38-C, por 80, dr 2060 ft; Caffarelli 1, share 19-A, por 81, spud in. E. L. Williams, Madrigal 1, share 5, por 72, dr below 500 ft.

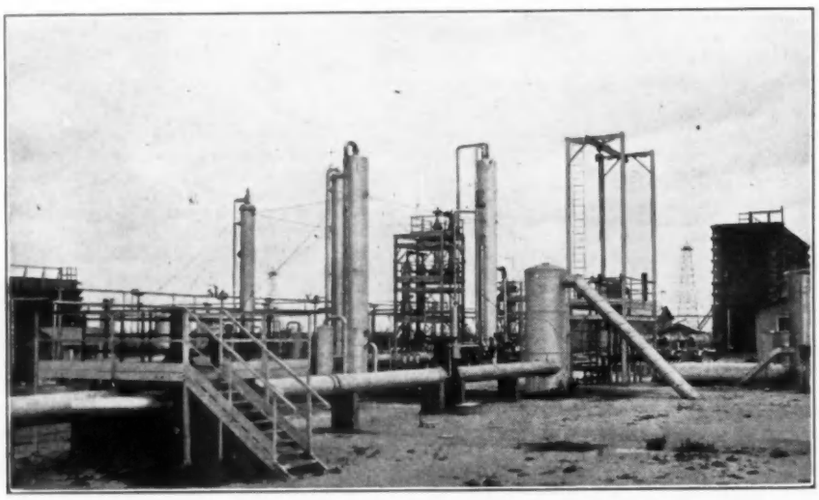
VICTORIA COUNTY—Cullen & West, Keeran 1, Telferner area, dr 2000 ft. Houston Oil Co., A. M. McFadden 1-A, IR No. 20 sur, dr 4250 ft. Humble O&R Co., Peter Rydolph 1, McFadden area, lcn. Texas Co., A. M. McFadden 4, J. M. Rine sur, McFadden area, trying to recover ds 2840 ft. Victoria Oil Co., Keeran 1, M. Lecn sur, cap 5284-85 ft, sand 5285-5301 ft, show large gasser, dr deeper.

WEBB COUNTY—Blair & Livingston, J. M. Garcia 1, sur 11, dk. French Oil Corp., Benavides 4-A, sur 659, West Cole, top sand 2334 ft, set csg, woc. McGinley Corp., A. S. Billings 1, sec 71, blk 1, CCSD & RGNR sur, sp in. Phillip Rosenberg, D. Green 2, sec 233, dr 1962 ft. Tompkins & Edwards, Ortiz 1, sec 1808, GC&SF sur, dr 150 ft.

WILLIAMSON COUNTY—H. A. McLean, R. C. Miller 1-A, Manlove & Robinson sur, dr abt 1220 ft.

WILSON COUNTY—Aug. M. Blume, Nickelson 1-A, C. Diaz sur, mov on. Sun Oil Co., Tudyk 1, nw part of county, unit block, mov on.

ZAPATA COUNTY — Allied O&G Co., Gutierrez 25, share 34, Fansler Partition, Comitas Grant, Escobas, top sand 1473 ft, set csg, woc. Ballard & Mercer, Flores 1, blk 27, por 37, set csg top sand 2441-46 ft, now sd. E. K. Bateman, M. Garza Estate 1, blk 41, Comitas Grant, s Escobas field, dr abt 500 ft. Joe Cullinan, Gutierrez 1, Charco de la India Grant, dr 100 ft. Hunt & Polk, Ramirez 1, share A, Villa Grant, dr 560 ft. O. W. Killam, Hinnant 1, blk 45, sur 613, Mirando Valley, dk. McGinley Corp., G. C. Flores 1, sec 250 dr 1285 ft; J. Bustamante 1, Comitas Grant No. 35, dr 1620 ft. Texas Co., Jennings 8, Cerrito Blanco Grant, Jennings, spud in. Windsor Oil Co., Martinez 1, blk 14, Charco Redondo Grant, dr 100 ft.



A View at the Repressuring Plant of Humble Oil & Refining Company In the Raccoon Bend field, Austin County, Texas.

GULF COASTAL FIELDS

Conroe Tests Due for Completion Next Week. Matagorda Field Delayed by Fishing Job.

WM. V. GROSS, *Staff Representative, Houston, Texas*

Montgomery County Tests Due to Complete Next Week

Houston.—Scouts of the Gulf Coast still were waiting for conclusive completion data June 3 on two wells in Montgomery County schedule to extend the producing area about a mile and a half east of the discovery well of Beach area in one instance and 2200 feet south in the other.

Strake Oil Corporation's South Texas Development Company 2, the scheduled southerly extension well, contrary to published reports, has not been completed, and on June 3 operators were attempting for the second time to get a satisfactory screen setting at 5026 feet. It was at this depth that the well was subjected to a satisfactory drill stem test, the well showing definitely for a producer of 38 gravity oil. Two 1000-barrel storage tanks have been erected to take care of the flush oil from No. 2, which probably will be run by Humble Pipe Line Company in view of pending purchase of Strake Oil Corporation's holdings in Montgomery County by Humble Oil & Refining Company. Four wells will be drilled on Strake Oil Corporation's holdings before the Humble decides whether to exercise an option to purchase the property for $3,500,000 in oil payments, a cash consideration of $500,000 being paid by the latter for taking a look at four wells.

Following completion of No. 2, the success of which appears highly probable, Humble Oil & Refining Company, according to terms of the option on Strake Oil Corporation holdings, will drill two wells. Location for these tests has not been announced, developments incidental to initial behavior of No. 2 at completion probably being depended upon to shed some light as to the best direction from the discovery well to prospect.

Heep Oil Corporation's J. R. Freeman 1, the easterly extension possibility, probably will not be brought in until June 7, according to Herman Heep, president of the corporation. Mr. Heep stated that the latest drill stem test made on the Freeman test brought oil to the surface in 21 minutes. Four 1000-barrel tanks and a 750-barrel gun barrel tank were being erected on the Freeman farm to take care of the flush. Mr. Heep would not announce the depth at which the test was made, refusing to verify either the 5110-foot or the 5137-foot reported depths, but did state the well has a little below 5000 feet.

Should the other test drilling in the immediate neighborhood, Heep's M. E. Roberts 1, now drilling below 4200 feet, get a showing, it would intensify the play to the north and east of the discovery well.

Two wells have been completed in the Beach area: Strake's South Texas Development Company 1, the discovery well, which is producing about 80 barrels from 4991 feet, and Heep's R. L. Cartwright 1, 1¼ miles east of the discovery well. This latter test was completed as a wet gasser at 5078 feet.

Austin County Wildcat Is Abandoned in Shale

Houston.—R. R. Mitchell and C. H. Taylor's Schelckte 1, Austin County wildcat located near Kenny, was abandoned this week in sandy shale at 3730 feet after a drill stem test of formation running from 3583 to 3683 feet showed only 300 feet of mud and a little gas. Previously the well had reported a slight showing of gas at 3361-75 feet.

Schleckte 1 originally was started by Parmesan and Kafferkey, who disposed of it to J. P. James et al, who in turn released it to Joe L. Mulvey et al.

Initials of Three Wells May Boost Field's Output

Houston.—Completion of two new wells and one work-over at Barbers Hill this week probably will pull the field's daily average production up above the figure of 21,400 barrels maintained during the week ending June 3.

The week's completions were: Sun Oil Company's Chambers 7, a work-over at 5233 feet which yielded 1000 barrels of 28.4 gravity oil through an half-inch choke; McAlbert Oil Company's Higgins B-2, on the southeast flank of the dome, which had an initial production of 359 barrels of 27.3 gravity oil when drilled in at 5197 feet; and Sinclair-Prairie Oil Company's J. F. Wilburn 12, completed at 4312 feet for 1500 barrels of 24.1 gravity, pipe line oil. It is flowing through an half-inch choke.

Locations were announced this week for two new wells to be drilled immediately at Barbers Hill, both projects of Texas-Gulf Producing Company, successor to the old Humphreys Corporation, one of the pioneers or Barbers Hill field. Both are east flank tests.

Buckeye Wildcat Pulling Screen and Liner at 7829

Houston.—United North and South Development Company's Stoddard 1, Buckeye Townsite wildcat in Matagorda County which was heralded last week as discovering a new oil field in the Texas Gulf Coast when it flowed by heads from 7829 feet with the bailer hung in the hole, is attempting to pull the liner and screen, according to advices received in Houston June 3.

Rabb Ridge Assures Summer Completions

Houston. — While the only completion this week at Rabb Ridge was a workover which yielded 2500 barrels of fluid, 72 per cent of which was water, several wells in the new Fort Bend County field have reached depths which assure their completion during the summer, barring unforseen delays.

Humble Oil & Refining Company and Gulf Production Company's H. P. Lockwood 3, for example, has passed 5200 feet. The same operators F. I. Booth Estate 1 was drilling below 4450

Gulf Coast Field Operations

Completions

LOUISIANA GULF COAST

Company, Well and Location—	Initial Production Bbls.	Depth
BAY ST. ELAINE—		
Freeport Sulphur Co., Wurzlow 2 ..	*	1610
BAYOU CHOCTAW DOME—		
Standard Oil Co. of La., Gay 2....	*	6294
CHACAHOULA DOME—		
States Prod. Co., W. H. Starck E	*	872
DOG LAKE—		
The Texas Co., State Dog Lake 5	*	3519
IOWA—		
Shell Pet. Corp., O. A. Fontenot 1	640	6912
PORT BARRE—		
W. A. Aggers, S. D. Cochran 1	*	3644

TEXAS GULF COAST

AUSTIN COUNTY—		
R. R. Mitchell & C. H. Taylor, Schleckte 1, near Kenny	*	3730
BARBERS HILL—		
McAlbert Oil Co., Higgins B-2	359	5197
Sinclair-Prairie Oil Co., J. F. Wilburn 12	1500	4312
Sun Oil Co., Chambers 7, wo	1000	5233
PIERCE JUNCTION—		
Rio Bravo Oil Co., Settegast A-7..	*	4272
A. & P. Production Co., K. F. Whitehead 7	*	5666

feet in shale June 3; their George B-1 had passed 3250 feet.

The week's completion was Humble and Gulf's J. H. P. Davis 1, results of which were not considered very satisfactory.

The Texas Company's Wolters 1, located approximately a half mile north of production at Rabb Ridge, is drilling below 2200 feet in gumbo.

Cullen & West to Deepen Burt 4 At Humble Field

Houston.—After failing to make a producer of Burt 4 at Humble at 4825 feet, when a sand showing oil had been entered at 4800 feet, Cullen & West will deepen the well.

Sun Oil Company's River 53 is preparing to pump at 1328 feet after showing for a producer at 1251-1326 feet.

The Texas Company's W. & P. Fee 25 was abandoned in cap rock at 1740 feet this week. Fee 25 had a showing of oil at 1438-45 feet.

Humble oil field is one of the several older fields in the Gulf Coast which have shown signs of new life since conditions within the industry began to improve late in the spring. It produces about 6600 barrels per day.

Cheek Dome Prospect Hits Marine Oligocene at 6378

Houston.—Jack Schultz' O. M. Todd 1, wildcat prospect of Cheek dome area in Jefferson County, picked up the Marine Oligocene at 6378 feet June 3 and drilled into a lime at 6388 feet after making a faint showing of oil at the former depth.

This test, situated in the northwest corner of the William Carr Survey, is two miles northwest of Humble Oil & Refining Company's Ross B. Nelson 1, in the William Rice Heirs Survey, which was abandoned in shale at 6537 feet.

Considerable interest is attached to developments in the Todd well as it is admittedly "hotter" than any prospect that has been drilled in an effort to get production at the Jefferson County prospect. It also is reported to be running considerably higher than the Humble test, and indications are another well will be drilled in the region on strength of geological findings in the Todd 1 even if it eventually is abandoned as a dry hole. Todd 1 has had several shows of oil, none of them serious enough to warrant a drill stem test.

Expect More Drilling at Iowa Following Completion

Houston.—Completion May 26 of Shell Petroleum Corporation's O. A. Fontenot 1, in the Iowa district of Cameron and Jefferson Davis Parishes, Louisiana, probably will result in additional drilling for the area during the summer, though no new locations have been announced by the Shell.

Fontenot 1, completion of which has been awaited with interest for several weeks, due to the fact that it is a 450-foot east offset to Magnolia Petroleum Company's Waite 1, yielded 640 barrels initially when the plug was drilled at 6912 feet. Since then the choke was increased in size to 18/64-inch with an attendant increase in production to 1100 barrels by June 3. The 41 gravity oil is coming from one joint of five-inch screen which was run in the hole on the bottom of a string of five-inch casing.

Houston.—Another attempt to develop deep production at Bayou Choctaw dome in Iberville Parish, Louisiana, met with failure this week when Standard Oil Company of Louisiana ran into salt water at 6294 feet in Gay 2 and was forced to abandon the well.

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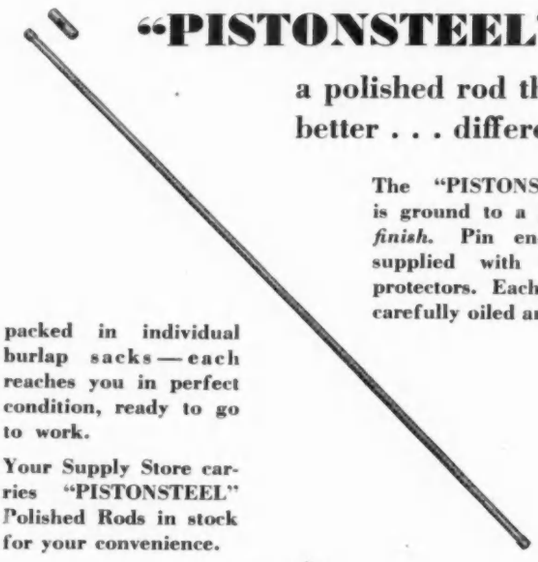

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NEW MEXICO . . . ROCKY MOUNTAIN

Hobbs Proration Plans Under Consideration. Greeley Area Under Drilling Revival.

Staff Correspondent, Casper, Wyoming

Hobbs Advisory Body Meets in Tulsa

Tulsa, Okla., June 2—An informal meeting of the Hobbs proration advisory committee was held here today in order that executives attending the mid-year meeting of the American Petroleum Institute could consider the several plans which have been submitted for unitizing the field.

A new proposal by the Midwest Refining Company was presented and added to the several other plans submitted by the engineering operating committee which will meet in Fort Worth Monday in an effort to devise from the available suggestion a practical basis for placing the field under unit operation.

Hobbs, New Mexico.—A reduction of 1000 barrels or more in the proration allowance of the Hobbs field for the June period is to occur as result of the Shell Petroleum Corporation having cut takings to about 11,000 barrels daily. The field has been allowed 30,500 barrels daily for the past six weeks. The above company is turning back about 2200 barrels, including about 1200 barrels purchased from The Texas Company, but the latter is to absorb its own production in the future, so the total crude nominations will not reflect the full cut.

Northeastern Colorado Activity at Peak

Greeley, Colo.—More work is under way and more in prospect for the northeastern Colorado district than at any time since the big campaign last summer. A new operation on the Niles tract will be carried on jointly by the Continental Oil Company, Manning & Terry, Platte Valley Petroleum Company and H. R. Niles. Location is a half mile northeast of the Briggs well in SE NE Section 13-6n-61w; gas from the Briggs well is to be used for fuel.

Ohio Oil Company will start drilling its well on the Butters tract, northeast of the Greasewood producers, as soon as material is on hand from Montana whence it is being shipped from the company's operation on Golden Dome, Carbon County. A new operation in the New Raymer district is announced by the Danciger Oil & Refining Company, Ramsey Brothers of Oklahoma, and an unnamed backer. Tulsa-Fort Morgan's Anthes 1, also in the New Raymer district, has cemented 15½-inch at 1050 feet, and is ready to resume. West of Keota, in Weld County, Weld Royalties Company has spudded its Ella Peters 1. Southeast of Fort Morgan Judge Fred W. Freeman, at one time manager for The Texas Company in the Rocky Mountain states, is interesting himself in a block of acreage on the Clem Lee and Dr. Lusby block which was core drilled by Midwest Refining Company last year.. The block consists of 11,000 acres, and is reported to be a promising structure.

An extension of six months has been granted Reiter-Foster Oil Corporation by the Platte Valley Petroleum Company for a test on the William Wilson 1 location, NE SE Section 24-6n-61, Greasewood, which is bottomed at 440 feet. Continental Oil Company's Gadbois 1, SE SW Section 24-6n-61, is an abandonment; production was five barrels per day when it was decided to give the test up as uncommercial.

Drilling Resumed in Muleshoe Dome Test

Fairplay, Colo.—Following a winter shut-down, work has been resumed by South Park Oil & Gas Company at Esche No. 1, NW Section 5-9s-76, in Park County, on a structure known as Muleshoe dome. Well is bottomed at 2465 feet in what is believed to be the Dakota, and a considerable showing of both oil and gas has lent encouragement to the operator. Crew is fishing for casing spear in the hole after having bailed out water which is believed to be coming in from parted 8¼-inch casing.

Three Wells to Start In Cut Bank Area

Cut Bank, Mont.—Northeast of the O'Neil interests' producing gas wells in the Cut Bank field, north of here, The Texas Company has announced location on SW Section 6-36n-4w, in Toole County, for the first of three wells to be drilled this summer. The company hopes to develop oil in this district, it is said.

The Tarrant well is delayed with a complicated fishing job on NW SW Section 13-35-6w, having dropped two underreamer lugs, a three-prong grab, and the pipe in the hole. The well is only a short distance above its objective, being bottomed at 2835 feet.

New Mexico and Rocky Mountain Field Developments

NEW MEXICO

Completions

Company, Well and Location—	Initial Production Bbls.	Depth
EDDY COUNTY (Artesia Field)—		
Leonard & Levers, 7, sw se 19-17-30	685,000 cu. ft.	970

New Operations

CHAVES COUNTY—R. D. Compton, sw se 20-10s-24.

CURRY COUNTY—Southwest Oil Production Co., 15-5n-33.

EDDY COUNTY—New Mexico Oil Syndicate, McClelland 1, ne 22-22-23. W. A. Scott, Kaiser 1, nw se 7-18-27, dr 500 ft.

HARDING COUNTY—Carbon Dioxide Corporation, Tinsley 1, 31-21n-31.

LEA COUNTY—The Texas Co., State 3A, lot 2, 2-21-33. Midwest Refining Co., Turner 29, nw 34-18-38. Midwest Refining Co., State 26, se 9-19-38.

Wildcat Drilling Report

(Wells shut down not included)

BERNALILLO COUNTY—Norrins Realty, Pajarito Grant 1, 22-9n-1e, fsh cas 1295 ft.

CHAVES COUNTY — Warman Oil Trust, Evans 1, 15-14s-25e, dd from 1162 ft.

CURRY COUNTY—G. L. Trout, 24-2n-31, sd for orders 958 ft.

DE BACA COUNTY—Montgomery et al, Wood 1, sw 6-4n-20e, installed new boiler, resuming 4662 ft. Landowners Oil Co., State 1, ne 16-1s-27e, sd for orders.

DONA ANA COUNTY—Middle States O. & G. Co., Boretzi 1, 14-26-5e, rigged.

GUADALUPE COUNTY—N. M. Prod. & Ref. Co., McMillan 1, 24-5n-16e, dr 4336 ft.

LEA COUNTY—Baker Oil Co., Inc., sw nw 15-13s-33e, location.

LUNA COUNTY—Angelus O. & M. Co., State 3, se 30-21-10, try to reset cas 6171 ft.

RIO ARRIBA COUNTY—Governador Oil Co.'s 1, se 15-29n-7w, carrying 5 3/16 inch at 2030 ft, td 2070 ft.

ROOSEVELT COUNTY—Peterson Oil Co., Good 1, se ne 32-5s-30e, rig up.

WYOMING

CARBON COUNTY—Prairie O&G Co., 1, 29-37-89, plugging back to Lakota from 6737 ft. Midwest Refining Co.'s U. P. 27, 27-11-81 dr 4025 ft.

CONVERSE COUNTY—John Ackard, se 24-33-72, dr bel 2000 ft.

FREMONT COUNTY—Wiebolt et al, 35-33-99, dr in Tensleep 2670 ft. Ward O&G Co., 28-34-90, rigging up. Yellowstone Oil Co., Gabus 1, sw 14-38n-94w, resuming 918 ft.

NATRONA COUNTY—Mutual Oil Synd., Midway 2, sw se 14-36-79, coring saturated sand 5255 ft.

SHERIDAN COUNTY—R. & D. Oil Co., nw se 21-57-97w, sd around 1450 ft.

SWEETWATER COUNTY—Vermillion Oil Co., sw sw 16-12n-99w, resuming 4685 ft.

WASHAKIE COUNTY — Bales Oil Trust, Brome 1, ne nw 31-48n-90w, run 8¼ inch to bottom 1105 ft.

WESTON COUNTY—Julius Peters et al, Weitzell 1, sw nw 30-46-64, dr bentonite, 3850 ft. Martens & Paulsen, sw se 31-47n-63w, lcn. Gose Syndicate, ne 28-47n-63w, ur to lower 6¼ inch, td 5050 ft. LeFaivre Oil Synd., nw se 29-45n-68w, to resume June 1, td 1800 ft. Dearing Oil Co., ne nw 6-46n-63w, rig up.

LOUISIANA FIELDS

Lack of Water Hampers Drilling at Zwolle. Three Tests to Start On Louisiana Blocks.

Staff Correspondent, Shreveport, La.

Two Producers Week's Record at Zwolle

Shreveport, La.—Pelican Natural Gas Company's Sabine 8, NE NE SW Section 3-7-13, a southwest edge well in the southwest offshoot of the Zwolle townsite pool, was officially completed during the last week flowing 300 barrels of oil daily partly pinched in at total depth of 2370 feet. First estimates gave the well's potential daily average at 1000 barrels. Marl was logged at 2040 feet, about 20 feet high for most wells in that part of the field. Production is coming from chalk.

Only one other producer was completed in Zwolle for the week ending June 1, this being F. G. Reid's McNeely A-1, Section 14-7-11, in the southeast field, pumping 20 barrels daily at 2502 feet. M. L. Friend's Ezernack 1, Section 2-7-13, between two producers, was dry at 2525 feet in chalk. Other dry holes were: Service Drilling Company's Louisiana Long Leaf 1, Section 12-7-11, 2680 feet; M. J. Kissick's Buvens 1, Section 20-7-11, at 2640 feet; Zeke Lohman's McCormick 1, Section 12-7-11, at 2680 feet.

Zwolle Water Shortage Retards Drilling in Field

Shreveport, La.—The Zwolle field after recording from 12 to 19 locations per week for the last several weeks, showed a drop in number of new operations projected during the last week, only five new tests for that area being announced. The fact that several wells have been forced to shut down for lack of water, and that a low water supply is being felt in some cases in the newest "hot spot" of production, one mile southwest of the Zwolle town limits, may have contributed to the drop.

Four of the five new locations, however, during the last week were for the southwest offshoot from the Zwolle townsite pool.

E. F. Neely is installing a power unit for the pumping of four wells in the southeast part of the field in Section 14-7-11, using one gasoline engine to drive the wheel which operates several shackle lines. Loring Oil Company for some time has been using electrically driven pumping units in Zwolle.

Two wells which are using air lift equipment showed the following daily average net oil yield for the last week: Rush and French's Martinez 1, Section 11-7-13, 242 barrels of oil; and Tooke and Reynolds (formerly H. W. Perritt), Bowman-Hicks 3, Section 2-7-12, 77 barrels of oil.

Shreveport, La.—J. M. Bridges' Armstrong 1, Section 28-10-11, Sabine Parish, six miles east of Pleasant Hill production and 4½ miles north of the discovery well in the Spring Ridge field, which encountered 16 feet of sand at 3373-89 feet, tested six fourbles of salt water in a drill stem test during the last week.

Block Acreage for North Louisiana Wildcat Tests

Shreveport, La.—O. S. Golden and Associates have blocked 4000 acres of leases centering in township 12, range 5, Natchitoches and Winn Parishes where there are several salt domes.

W. G. Strange has blocked 6000 acres in Vernon Parish, south of the Sabine Uplift, and centering in Section 5-2n-9w, for a test to start within six months. W. C. Feazel and Fred Kalil have recently blocked 8000 acres in Morehouse Parish in townships 20 and 21-6e, and will start a test by the middle of July. Hyde and Associates have completed an 8000 acre block in West Carroll Parish for a test by July 1.

N. B. Porter has blocked 2000 acres in DeSoto Parish to explore the Tokio horizon which produces at 2900 feet in Holly and will spud a test by August 15. This block is three miles southeast of Mansfield and centers in Section 26-12-13.

Louisiana Field Developments

New Operations

DeSOTO PARISH—J. W. Barton, et al, Mansfield, Nabors 1, 700 ft s and 100 ft e of nw cor of ne¼ of sec 6-12-11.

RED RIVER PARISH—Petroleum Inds., Inc., Shreveport, Madden 1, 1650 ft w and s of ne cor of sec 21-10n-14w.

SABINE PARISH—Mark Curtis, Shreveport, Curtis 1, 330 ft s and e of se cor of ne¼ se¼ of sec 35-8n-13w.

CAMERON PARISH—Jim Oil Co., Inc., Lake Charles, La., Erwin 8, 13-12s-10w, 1820 ft n and 1495 ft w se cor sec. Yount-Lee Oil Co., Beaumont, Texas, School Ld. 11, 16-12s-10w, 2810 ft w of e line and 1680 ft n of s line of sec.

IBERIA PARISH—Jefferson Lake O. Co., Inc., City, Lake Peigneur 33, ..-12s-5e, 192 ft n and 43° 18 ft 55″ e of Well No. 9 in Lake Peigneur in Sec. Jefferson Lake O. Co., Inc., 34, ..-12s-5e, 300 ft s 34° 0 ft 27″ e of Well No. 5 in Lake Peigneur in sec. Jefferson Lake O. Co., Inc., 35, ..-12s-5e, 248 ft s and 39° 35 ft 54″ w Well No. 3 in Lake Peigneur in sec.

SABINE PARISH — Southland Drlg. Co., Many, La., J. T. Davis & Armstrong 28-7n-11w, 600 ft s and 265 ft e nw cor sec. C. D. Neff, Tr., City, Peterson 1, 36-8n-13w, 200 ft n and w sw cor nw¼ nw¼ sec. F. E. Stancil, Gladewater, Texas, Ponder 1, 10-7n-11w, 397 ft e and 273 ft s nw cor ne¼ se¼ sec. Adams & Robinson, City, Peterson 1, 35-8n-13w, 406 ft n and 200 ft w se cor ne¼ ne¼ sec. F. G. Reid, City, McNeely B-1, 14-7n-11w, 400 ft s and 110 ft w ne cor ne¼ nw¼ sec. O. B. Welbain, City, Sabine Lbr. Co. 1, 9-7n-13w, 330 ft s and e nw cor ne¼ ne¼ sec. Baird & Baird, City, Martinez 1, 2-7n-13w, 300 ft s and e nw cor ne¼ sw¼ sec. Ben Merritt, Tr., Many, La., Nulton 1, 3-7n-13w, 400 ft w and s ne cor sw¼ ne¼ sec. C. T. Ruffin, Tr., Mansfield, La., Lillie 1, 8-7n-11w, 860 ft w and 260 ft s ne cor ne¼ nw¼ sec. Supreme Oil Co., Inc., City, S. A. Pruett 1, 30-8n-11w, 330 ft n and e sw cor se¼ sw¼ sec. S. A. Lane et al, City, F. Dikeyrer 1, 23-7n-11w, 233 ft e and 330 ft s nw cor ne¼ sec.

Completions

Company, Well and Location—	Initial Production Bbls.	Depth
CADDO PARISH—		
Calatex O&G Co., Scott 1, 5-16-16..	¶1	2952
SABINE PARISH (Zwolle)—		
Lanier et al, Petty 1, 11-7-11.....	50	2575
UNION PARISH (Monroe)—		
Southern Carbon Co., Fee 9, 17-20 4e	¶9	2160
SABINE PARISH (Zwolle)—		
Service Drilling Co., 4 L 1, 12-7-11	*	2680
M. J. Kissick, Buvens 1, 20-7-11...	*	2640
Zeke Lohman, McCormick 1, 12-7-11	*	2680
F. G. Reid, McNeely A-1, 14-7-11	20	2502
M. L. Friend, Ezernack 1, 2-7-13..	*	2525
Pelican Nat. Gas Co., Sabine 8, 3-7-13	300	2370
CALDWELL PARISH—Monroe Pet. Corp., Burton 1, 36-12-2e	*	2986
TENSAS PARISH—		
A. R. Smith, Curry 1, 39-11-12e...	*	3545

Wildcat Drilling Report

(Wells shut down not included)

BOSSIER PARISH—Miller et al, Newell 1, 12-19-11, cored shale 465 ft (second hole).

CALDWELL PARISH—Carter Bell et al, A. R. Taylor 1, 17-14-4e, dr lime 3397 ft.

DE SOTO PARISH—Walters & Nicholson, Jim Guy 1, 3-11-13, base chalk 1845 ft, sd for reprs 2403 ft. E. T. Oakes, Johnson 1, 30-13-15, core lime and shale 3616 ft. DeSoto Dev. Co., Nickie 1, 7-13-12, dk. Donly Bros. H. Smith 1, 31-14-15, sd repr pump, 2295 ft. Standard Oil Co. of La., Sutherlin 1, 19-12-14, dr chalk rock 1877 ft. S. A. Guy, Dowling 1, 31-14-14, top chalk 1650 ft, dr chalk 1700 ft. Coker et al, Boone 1, sw nw 12-10-11, dk.

GRANT PARISH — Security Pet. Corp., Swope 1, 16-9-1e, top oil sand 1537 ft, 6-inch 1540 ft, swabbed dry, wo td 1583 ft. Robichaux et al, Bradford 1, 16-9-1e, dk.

NATCHITOCHES PARISH — Southland Drilling Co., Ross Olive 1, 10-9-10, cemtd 12½ cas 110 ft. Dr. H. S. Gerson et al, Smith 1, 11-10-8w, dr shale 1770 ft; Smith 3, 6-10-8w, lcn. H. W. Perritt, Brown Lbr. Co. 2, 29-8-9, sd 1670 ft; Cook 1, 3-8-9, arr set 6-inch cas, td 2373 ft, shale. Rains et al, Beard 1, 8-8-10, dk. Texana Oil Co., Clarke-Morse 1, 23-5-6w, sr, td 2504 ft.

OUACHITA PARISH—Wilson & Mitchell, W. L. Williams 1, 5-16-1e, sr, td 3200 ft.

RED RIVER PARISH—C. F. Davis, Peter-

son 1, sw nw 12-14-11, dk pat. Lawrence Deckett, Tr., Madden 1, sw ne 21-14-10, dk.

SABINE PARISH—J. J. Kean, Belton 1, 31-9-13, elev 232.7 ft, pulling 6-inch cas, td test top Zwolle chalk at 1600 ft, td 3128 ft (lower Cretaceous). R. L. Gay, Tr., Long-Bell A-1, nw nw 10-8-13, cored small streaks anhydrites at 5490 and 5528 ft, core shale and lime 5628 ft. J. H. Askew, Sabine 1, ne nw 9-7-13, 10-inch 100 ft, cemtd 6-inch cas 2002 ft. Geo. LeGrand, McGowan 1, nw nw 2-8-10, dr 1000 ft. Loring Oil Co., Bowman-Hicks 18, 15-7-12, core lime 5190 ft. Wiliams & Spiers, Williams 1, sp 10-inch 100 ft, sd for water 790 ft. State Prod. Co., Davis 1, 17-7-10, dr shale 2612 ft. King, Tr., Davis 1, 29-7-11, lcn. J. I. Hall, Williams 1, se nw 3-7-10, top Zwolle marl 2752 ft, top chalk 2795 ft, bailed dry and sd, td 2831 ft. J. M. Bridges, Armstrong 1, 28-10-11, chalk 1559-2074 ft, claimed sand showing oil from 3373-89 ft, tested six fourbles sw in ds test, wo td 3390 ft. G. E. Jordan, Dew 1, sw se 34-8-11, dk pat. State Prod. Co., Davis B-1, 17-7-10, dk pat. C. H. Tuttle, Byrd 2, nw nw 7-7-10, sp dr 800 ft. R. E. Davidson, Davis 1, 28-7-11, dk. S. A. Lane et al, DeKeyser 1, nw ne 23-7-11, dk. Covington, Clark et al, Bill Bray 1, se nw 32-7-11, dk. Supreme Oil Co., Pruitt 1, se sw 30-8-11, dk pat. Broderick & Calvert, Costullo 1, 2-7-14, dr 500 ft.

VERNON PARISH—Llano Cooperative Colony, Fee 1, nw ne 34-2n-9w, dk.

ARKANSAS FIELDS

Arkansas' Lone New Start In Union County Wildcat

El Dorado, Arkansas.—Charles Steele and Associates during the last week erected a derrick and are rigging up for a wildcat test in Union County, Arkansas, Anderson 1, NW SE Section 36-12-18. It was Arkansas' only new location during the week.

Smackover Deep Test Stops At 7255 Feet in Salt

El Dorado, Arkansas.—Ozark Natural Gas Company's C. E. Jones 1, Section 32-9n-32w, Crawford County, northwest Arkansas, was abandoned during the past week as a dry hole at 2552 feet in white sand; elevation was 391 feet.

J. H. Flowers' White 1, Section 13-6-26, Logan County, a test which has been inactive for some time has been abandoned dry at 3570 feet.

Although the derrick and rig still remain on the location, Lion Oil Refining Company and Associates' Guy P. Hayes A-9, NE NE Section 4-16-15, Union County, a deep test for the Smackover district, has been dropped from the reports as an abandoned and junked hole at total depth of 7255 feet in pure salt of Permian age; elevation is 96 feet. This is the deepest hole ever drilled in North Louisiana or Arkansas.

Arkansas Field Developments

Completions

CRAWFORD COUNTY—
Ozark Nat. Gas Co., C. E. Jones 1, 32-9n-32w . . . . . * 2552

LOGAN COUNTY—
J. H. Flowers, White 1, 13-6-26.. * 3570

UNION COUNTY—
Lion O. R. Co. et al, Guy P. Hayes A-9, 4-16-15 . . . . . * 7255

New Operations

OUACHITA COUNTY—Chas. Steel et al, Anderson 1, nw se 36-12-18, rig up.

Wildcat Drilling Report

(Wells shut down not included)

ASHLEY COUNTY—D. S. Brooks et al, Crossett Lbr. Co. 1, sw se 31-15-6, top Nacatosh 3155 ft, cored sandy lime 3388-96 ft, dr 3405 ft.

CRAWFORD COUNTY—Ozark Nat. Gas Co., C. E. Jones 1, 32-9n-32, elev 391 ft, dry abn, td 2552 ft, white sand.

DREW COUNTY—Cooperative Dev. Co., Ogles 1, 35-13-5, core sandy lime 2205 ft.

MILLER COUNTY—Fitzwater et al, E. L. Beck 1, sw se 33-15-26, top red beds 2812 ft, core shale 2920 ft. Noel et al, Dickson 1, 11-20-27, fsh ds, td 2600 ft.

OUACHITA COUNTY—Copenhaver et al, Berg 1, 13-15-17, 700 ft oil in hole, wosr 2208 ft.

SCOTT COUNTY — Heavener O&G Co., Reser 1, 36-4-26, fsh cas, td 1436 ft.

UNION COUNTY — Southern Prod. Co., Wingfield 1, 16-19-15, cored sw sand 4512 ft, sd hauling drill stem, td 4512 ft. Pigeon Hill Oil Co., Union Sawmill 1, nw sw 19-17-12, top Graves sand 2762 ft, top Blossom 2887 ft, coring for Urbana sand 3490 ft.

WASHINGTON COUNTY—Chase & Rogers, Cunningham 1, sw ne 14-15n-32w, lcn.

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SOUTHEASTERN STATES

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Jackson Gas Field Gets One Completion.

One Completion, No Starts In Jackson Gas Field

Jackson, Mississippi.—James A. Alexander, Trustee, during the last week completed Fitzhugh 1, located 1740 feet east and 225 feet north southeast corner Section 1-5-1e, Rankin County, in the northeast part of the Jackson gas field, as a gasser estimated at 25 million cubic feet of gas, total depth of 2394 feet in Midway chalk, which was logged at 2391 feet. Black shale was logged at 2293 feet; elevation is 272 feet. This is the ninetieth gasser for the Jackson field.

Hatchetigbee Anticline Test Drilling Hard Rock

Jackson, Alabama.—Tidal Oil Company and Associates during the past week encountered an exceedingly hard rock formation in Everett & Boykin 1, NE SE Section 33-6n-2e, Clarke County, Alabama, on the Hatchetigbee Anticline, at 2563 feet and in making the next three feet cut out the fishtail bit being used. A core bit on hand could not cut a core and the test was shut down at 2566 feet waiting for another bit.

P. J. McAlpine and Associates were shut down at 1635 feet in sandy lime during the past week changing from rotary to cable tools in Gardner 1, NW NW Section 22-15s-16w, Lamar County, Alabama.

Northeast Mississippi Test Showing Was False Alarm

Jackson, Mississippi. — Lowndes County Oil & Gas Company's Carr Estate 1, Section 34-17n-16e, Lowndes County, northeast Mississippi, which encountered a brown sand from 1040 to 1045 feet, which the owners said showed oil, tested dry in a drill stem test at that level during the past week and later were drilling ahead in gumbo at 1046 feet.

Mobile, Alabama.—Ohio Oil Company is moving in rig from the East Texas field to drill a 7000-foot test in Mobile County, Alabama, seven miles northwest of Mobile. The location for the test, Harold and James Bethel 1, is northwest corner SW NE Section 34-3s-2w.

Ohio Oil Company has a block of approximately 30,000 acres in southwest Alabama. The location was made after geophysical work was done.

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Supply Traffic Men Hold Annual Meet

Officials of the Oil and Gas Well Supply Traffic Association were elected at the meeting held recently in Columbus, Ohio. Important classifications and rate matters were considered. Officials elected are: President, M. A. Keith, International-Stacey Corporation, Columbus; first vice president, C. R. Cantrell, Continental Supply Company, St. Louis; second vice president, H. A. Bruner, Marion Machine & Foundry Company, Marion; treasurer, R. S. Seibert, Lee C. Moore Company, Pittsburg; secretary, V. E. Milsark, the Parkersburg Rig & Reel Company, Parkersburg.

Southeastern States Developments

Completions

MISSISSIPPI

Company, Well and Location—	Production Initial Bbls.	Depth
RANKIN COUNTY (Jackson)—		
Jas. A. Alexander, Tr., Fitzhugh 1, 1-5-1e	¶25	2394

Wildcat Drilling Report

(Wells shut down not included)

CLARKE COUNTY (Quitman)—F. X. Gowans, Elfring 1, se ne 13-1n-14e, arr set 10-inch cas 104 ft.

HINDS COUNTY — Miss. Minn. Oil Co., Edwards Land Co. 1, sw ne 23-6n-4w, core sand and shale 2932 ft, sd repair water pump, td 2932 ft.

LAMAR COUNTY (Purvis Dist.)—Stauffer & Kouri, Bond 1, se ne 18-2n-14w, 10-inch 1067 ft, arr test, td 1090 ft.

LOWNDES COUNTY — Lowndes County O&G Co., Carr Est. 1, ne nw 34-17-16, base Selma chalk 620 ft, tested dry thru ds 1040-43 ft in brown sand, after oil and gas show, dr gumbo 1046 ft.

STONE COUNTY—Hercules Sulphur Exploration Co., Lang 2, sw sw 28-3s-11w, sand 1971-92 ft, setting 6⅝ cas, td 1992 ft.

ALABAMA

CLARKE COUNTY (Jackson)—Tidal Oil Co. et al, Everett & Boykin 1, ne se 33-6n-2e, elev 65 ft, Ripley-Selma chalk 801-1340 ft, Eutaw 1340-1738 ft, dr hd rock 2566 ft.

LAMAR COUNTY (Vernon)—McAlpine et al, Gardner 1, nw nw 22-15s-16w, elev 503 ft, sd in sandy lime changing from rotary to cable tools, td 1635 ft.

MOBILE COUNTY—Ohio Oil Co., lease and lcn not given, mive in rig.

WASHINGTON COUNTY—South Ala. O. & G. Co., St. Stephens A-1, 26-7n-1w, elev 187.2 ft, dk and move in rig.

TENNESSEE

CHESTER COUNTY—Gilmore et al, Scott 1, top Eutaw 1045 ft, cementing 8-inch cas to shut off water flow, td 1195 ft.

FLORIDA

DADE COUNTY—East Coast Oil Co., Watick 1, 12-55s-40e, trying to land 6⅝ cas at 5000 ft, td 5400 ft.

LEVY COUNTY — Suwanee Pet. Corp., Sholtz 1, nw se 9-15s-13e, changing to rotary, td 4010 ft.

PINELLAS COUNTY—Pioneer Oil & Mining Co., Yerxa et al 3, 2-29s-16e, dr crystalized gypsum, 1380 ft.

WALTON COUNTY—Calumet Co., Walton L&T Co. 1, se ne 7-1n-17w, dk pat. Oil City Corp., Walton L&T Co. 1, ne nw 12-1n-19w, dr 4850 ft.

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EASTERN STATES

PENNSYLVANIA

Company, Well and Location—	Initial Production Bbls.	Depth
TITUSVILLE—		
Walter Ohls & Co., Byles & Harris 1	50	388
ALLEGHENY COUNTY—		
Leidecker & Grosser, Shenot 2	5	....

WEST VIRGINIA

BOONE COUNTY—		
Hill Gas Co., Covert 1	¶1¼	1349
CABELL COUNTY—		
Madison Gas Co., Taylor 1	¶¾	3187
GILMER COUNTY—		
Ellis Oil & Gas Co., Ellis Hrs. 1	¶¼	....
ROANE COUNTY—		
George Smith & Co., Kendall 1	¶½	2556
Buffalo Oil & Gas Co., Knopp 1	6	....
Reedy Oil & Gas Co., Riddle 5	¶1¼	1740
TYLER COUNTY—		
Howard Hall & Co., Johnson Hrs. 3	8	....

SOUTHEASTERN OHIO

MORGAN COUNTY—		
R. C. Whitner, Starrett 11	*	195
NOBLE COUNTY—		
Bradfield & Co., Carpenter 3	¶¼	971
WASHINGTON COUNTY—		
Thomas McVey & Co., Cordray Sisters 1	*	3754
First National Bank of Lowell, Pfaff 18	1	466

CENTRAL OHIO

BELMONT COUNTY—		
Ohio Fuel Gas Co., Brown-Humphrey 1	¶¾	1083
FAIRFIELD COUNTY—		
City Natural Gas Works, Hartman 5	¶½	1897
GUERNSEY COUNTY—		
East Ohio Gas Co., Quillan 2	40	3446
LICKING COUNTY—		
William Stricker, Stricker 9	2	....
Earl Bros. Walpole 2	5	762
MEIGS COUNTY—		
Barton & Utsinger, King 1	*	825
MEDINA COUNTY—		
Barnhart & Co., Funk 8	40	422
Edson & Co., Packard 37	*	377
Edson & Co., Shaw 23	20	294
Oko Oil & Gas Co., Watson 15	*	350
Oko Oil & Gas Co., Essig 55	*	292

NORTHWESTERN OHIO

SENECA COUNTY—		
E. E. Holsinger & Co., Bickler 1	3	1530

ILLINOIS

CLARK COUNTY—		
Stifal & Co., Lawrence 1	2	483

KENTUCKY

DAVIESS COUNTY—		
Hupp, French & Co., Chancellor 1	*	785
Thrasher & Brenner, Birch 1	8	....
Mida McMahan, Jones 3	*	620
Huff, Garrison & Co., Richardson 1	12	....
Ellis & Ashby, Cooper 1	125	620
Brenner & Adams, Williams 2	40	....
Frank Cox & Co., Bell 4	*	615
CHRISTIAN COUNTY—		
Unknown parties, Craft 1	¶¼	....
GRAYSON COUNTY—		
Kentucky Public Service Co., Seaton 1	¶1	....
Shartzer 1	¶½	....
HART COUNTY—		
Archie Compton, Robertson 1	350	....
OHIO COUNTY—		
James C. Ellis, Cromer & Cromer 3	5	....
B. & B. Oil Co., Hendrix 13	10	....
Paul Goldberg & Co., Owens 1	350	1000
Cane Run Petroleum Co., Bellamy 1	*	785

MICHIGAN

Company, Well and Location—	Initial Production Bbls.	Depth
ISABELLA COUNTY—		
Mellon-Pollock Oil Co., Thayer 2	300	....
MIDLAND COUNTY—		
The Pure Oil Co., Reed 2	850	....
McClanahan, Inc., Struble 5	500	....
T. K. Buzzard, Simms 1	*	3600

Houston.—Union Sulphur and Gulf Refining Company of Louisiana have entered into an operating agreement on several of the latter's old leases around Sorrento dome in Ascencion Parish, Louisiana, whereby the former will do the operating.

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Roxbury, Boston, Mass.

The Fable of the Man Who Bought a Hoist

A CERTAIN man contracted to raise the steel work for a great bridge . . . scheduling the work with railroad precision. ¶ No power line was near, so a 100 hp. gasoline hoist was needed. But when he went to buy, lo, there were 100 hp. hoists with engines both big and little, at prices high, and low. His bid was figured close, so he bought accordingly. ¶ The hoist did its best, but the engine was overworked . . . he didn't make his schedule. ¶ He could have bought a dozen hoists, conservatively rated, with the penalty money that he lost.

WAUKESHA ENGINES

Are conservatively rated to prevent costly shutdowns. *Write* for Bulletin 827. *Waukesha Motor Co., Waukesha, Wisconsin.*

REAL HORSE POWER NOT PAPER HORSE POWER

May we send a man to see you who will prove that wells make more oil, that there is less initial expense and that maintenance costs less when the wells are equipped with . . .

JENSEN ·JACKS·

Equipped with Electric Motors or Gas Engines (interchangeable). Also for use with pumping powers.

JENSEN BROS. MANUFACTURING COMPANY
Coffeyville, Kansas, U. S. A.
and Branches

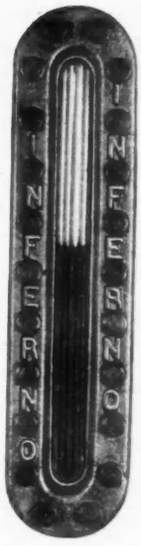
New Equipment for the Field

MACHINERY - TOOLS CATALOGS - BOOKS

▼ ▼ ▼

1. Water Gauge Glass

THE INFERNO COMPANY



The Inferno Company, Box 1080, Shreveport, Louisiana, has recently placed on the market a new high pressure water gauge glass for boilers. While the outstanding feature of this product is the safety provision, it is of such material that the water and steam show very plainly, being visible at 30 to 40 feet from a wide angle.

These gauge glasses are tested under 500 pounds of steam pressure before leaving the manufacturer's shop. However, for pressures above 300 pounds recommendation is made by the company for use of a specially prepared glass, the same as the new Inferno glass but with isinglass behind the glass to prevent steam from coming in contact with the gauge glass and therefore to prevent frosting on the glass.

The design is to meet the requirements of any high pressure boiler. The frame of the gauge is constructed of high grade malleable iron and bronze castings and the thickness of the glass is more than three-quarters of an inch of special steam resisting material.

Details on this new gauge glass are available upon request to The Inferno Company's address given above.

Wagon Motor

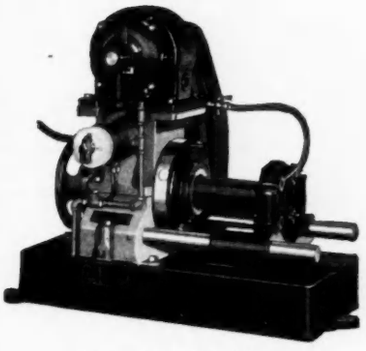
2. Split Phase Motors

WAGNER ELECTRIC CORPORATION

Wagner Electric Corporation, 6384 Plymouth Avenue, St. Louis, Missouri, announces Type 44RB 1/30 and 1/20 horsepower split phase motor, redesigned for quiet, smooth and continued operation. New features of the redesigned 44RB motor are: drip proof end plates, wool yarn lubrication, handy conduit box adjustable in four positions, and redesigned switching mechanism.

2. Portable Pipe Machine

THE OSTER MANUFACTURING COMPANY



Oster Pipe Machine

The Oster Manufacturing Company, 2067 East 61 Place, Cleveland, Ohio, announces a new portable "Tom Thumb" pipe machine for handling sizes of pipe ranging from half-inch to two-inch, with an extra capacity down to and including quarter inch pipe, designed for economical operation where only a small amount of work is done with the machine each day.

Dies of the machine are of the segment type held solidly in a holder. A separate die head is used for each size pipe to avoid lost time in changing dies. The die head is slipped on two vertical studs on the carriage, and when cutting off, the die head can be swung out of the way to provide clearance for the pipe.

A VV belt is used for driving from the motor to a spiral micarta pinion, then to a triple gear on the worm shaft. The final drive to the spindle is a triple thread worm mounted on automatically oiled Timken bearings. A three-jawed, quick acting, universal scroll type chuck is mounted on the front end of the spindle, and a three-jawed universal centering chuck operated by a hand wheel is mounted on the rear of the spindle. The motor is universal, variable speed, and reversible.

4. Joints for High Nickel Alloys

THE INTERNATIONAL NICKEL COMPANY

The International Nickle Company, 67 Wall Street, New York, has had reprinted for distribution the paper and illustrations on gas welded and brazed joints for high nickel alloys prepared jointly by F. G. Flocke, J. G. Schoener and R. J. McKay and presented before the thirty-second annual convention of the International Acteylene Association in Chicago in November.

— — — — — — *MAIL COUPON* — — — — — —

THE OIL WEEKLY,
Houston, Texas, U. S. A.

Please see that I am supplied, without obligation, additional information on New Equipment Items Nos. _____ described in the June 6, 1932, issue of THE OIL WEEKLY.

Name .....

Company .....

Address .....

Squeaks *from the* BULL WHEEL

An optimist is a guy who thinks his wife has quit cigarettes when he finds cigar butts around the house.

Any old cat can be the cat's whiskers, but it takes a tom cat to be the cat's paw.

A New York movie palace advertises one of their pictures as follows—"He promised her a pent house in New York, but she ended up in two furnished rooms with a baby."

Oh, well, that's better than one furnished room and two babies."

"Here's mother's ashes in the jar on the mantlepiece."

"So your mother is with the angels!"

"No, sir; she's just too lazy to look for an ash tray."

Father criticized the sermon, mother disliked the blunders of the organist, and the eldest daughter thought the choir's singing atrocious.

The subject had to be dropped when the small boy of the family, with the school boy's love of fair play, chipped in with the remark "Dad, I think it was a jolly good show for a penny."

His car and her car met head-on. Both drivers got out, and with that fine courtesy so characteristic of motorists nowadays, both began to apologize profusely.

"I'm so sorry," said the woman, "it was all my fault."

"Not at all, madame," the man responded with a gallant gesture; "I was to blame myself."

"But I insist the fault was mine. I was on your side of the road."

"That may be true; but, my dear, madame, I am responsible for the collision. I saw you coming, blocks away, and I had ample opportunity to dart down a side street."

Sambo, in heaven, had just got Rastus, far below on the asbestos ouija board. "Hello, Rastus. How you getting along?"

"Oh, I's havin' a fine time. Don't haf to work much jest shovel in some coal now and then. How you-all?"

I'se workin' purty hard. We haf to sweep up de clouds, pull in de stahs, switch on the light, an' give de ole sun a shove every mornin'."

"How come you-all have so much work to do?"

"Well sah, to tell the truth, we're kinda short o' help up heah."

"If a man marries a widow by the name of Elizabeth with two children, what does he get?"

"Give up."

"A second-hand Lizzy and two runabouts."

Carl: "Darling, in the moonlight your eyes shine like pearls."

Helen: "When were you out in the moonlight with Pearl?"

"So you refuse to let me have $5? Don't you know that one friend should always help another?"

"Yes, but you always want to be the other."

"Has your husband any hobbies?" asked the neighbor.

"No," said Mrs. Tuggle, "he has rheumatiz a good deal, and hives now and then, but he ain't never had no hobbies."

He was very hungry, so he pushed open the swinging doors of the restaurant and entered. It was a rough, ill-smelling place, but he thought he would try a cup of coffee and something to eat.

The waitress brought coffee in a thick, heavy cup.

"Where's the saucer?" inquired our fastidious friend.

"We don't give no saucers here," replied the girl. "If we did, some ill-bred ignoramus would come blowing in, and drink out of his saucer, and we'd lose a lot of our swellest customers."

Here is a Siamese newspaper that makes a bold bid for English-speaking patronage, and it does so in the following impressive terms:

"The news of English we tell the latest. Writ in perfectly style and most carliest. Do a murder get commit, we hear and tell of it. Do a mighty chief die, we bublish it and in borders of sombre. Staff has each one been college, and writ like the Kipling and the Dickens. We circulate every town and extortionate not for advertisements. But it. By it."

Old Maid: " So the waiter said to me, "How would you like your rice?"

Friend: "Yes, yes, go on."

Old Maid: "So I says, wistful-like, 'Thrown at me, big boy.'"

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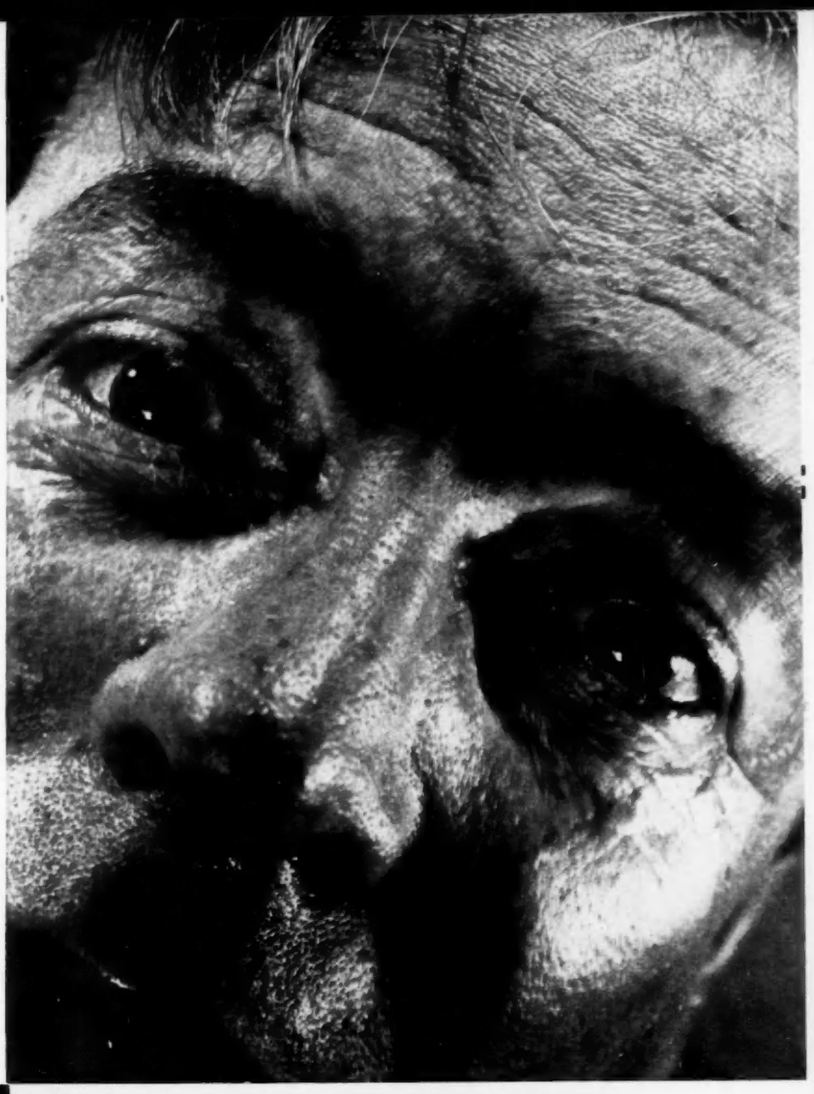
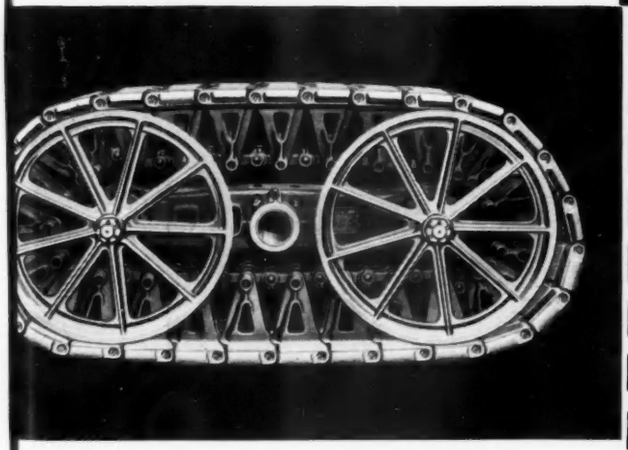
WAKE UP!



Cut down the time you lose in moving equipment! Get faster delivery—*consistently dependable* delivery—regardless of ground conditions. Wake up to the amazing advantages of hauling the Athey Way!

You'll haul over sand or mud or hills with the speed that comes from *uninterrupted operation* when you equip with Atheys. You'll do this every day that you want to haul—for Atheys work at steady speed, rain or shine. And remember, the new Athey Series 32 Truss Wheels are tougher and sturdier in every part to last *even longer* than ever before!

Investigate the new Athey Series 32 Truss Wheels. Write for information TODAY!



- TRACK WHEELS MOUNTED ON BALL BEARINGS
- CENTRALIZED LUBRICATION
- BUSHED MAIN AXLE BEARINGS
- HEAVIER TRACK ASSEMBLIES
- OVERSIZED PINS AND TRIP CHAINS
- DETACHABLE BEARING CAGES
- SIMPLE ASSEMBLY
- NEW SELF-CLEANING ABILITY

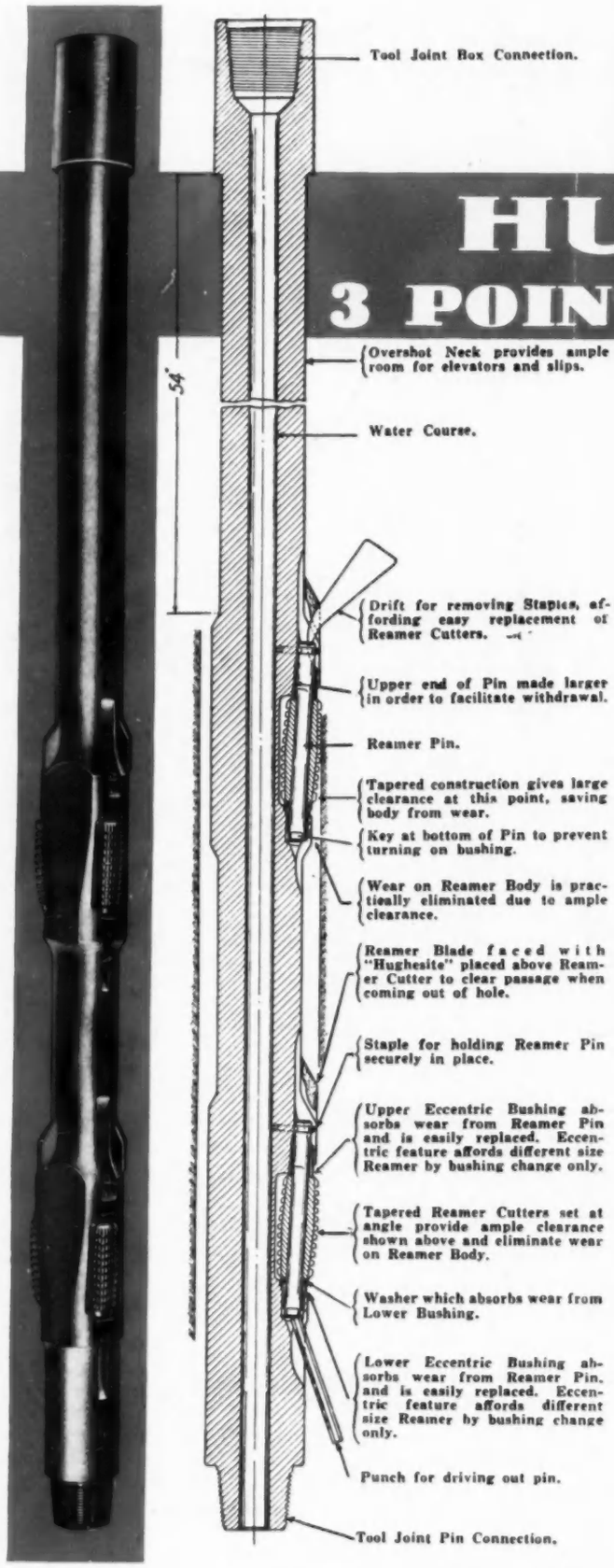
new low prices—

PER PAIR
10-Ton - $845.00
15-Ton - 1045.00
20-Ton - 1295.00

F. O. B. CHICAGO

ATHEY TRUSS WHEEL CO., CHICAGO, ILLINOIS
Dept. E, 130 North Wells Street Cable Address: "Trusswheel" Chicago

ATHEY
TRUSS WHEELS


Tool Joint Box Connection.
54"
Overshot Neck provides ample room for elevators and slips.
Water Course.
Drift for removing Staples, affording easy replacement of Reamer Cutters.
Upper end of Pin made larger in order to facilitate withdrawal.
Reamer Pin.
Tapered construction gives large clearance at this point, saving body from wear.
Key at bottom of Pin to prevent turning on bushing.
Wear on Reamer Body is practically eliminated due to ample clearance.
Reamer Blade faced with "Hughesite" placed above Reamer Cutter to clear passage when coming out of hole.
Staple for holding Reamer Pin securely in place.
Upper Eccentric Bushing absorbs wear from Reamer Pin and is easily replaced. Eccentric feature affords different size Reamer by bushing change only.
Tapered Reamer Cutters set at angle provide ample clearance shown above and eliminate wear on Reamer Body.
Washer which absorbs wear from Lower Bushing.
Lower Eccentric Bushing absorbs wear from Reamer Pin, and is easily replaced. Eccentric feature affords different size Reamer by bushing change only.
Punch for driving out pin.
Tool Joint Pin Connection.

STUDY THE MANY ADVANTAGES OF—

HUGHES 3 POINT REAMERS

Single and Double Stage

●

The Hughes "3-Point" Reamers are being used successfully in many leading fields. Operators and Contractors who have used this Reamer say it is less expensive to operate than any other reamer and that its life is much longer. It has earned the right to join the family of Hughes Tools—each of which must continuously prove itself the "best" of its kind in order to remain on the list.

—Minimum Wear and Consequent Low Upkeep.

—Patented Reamer Cutters.

—New Ease of Handling.

—Built-In Economy.

●

SOLD BY SUPPLY STORES EVERYWHERE

Service Plants:
Los Angeles
Oklahoma City
Midland

Export Offices:
19 Rector St.,
New York City

Hughes Tool Company, Houston, Texas